COMPUTERWORLD

NEWSPAPER

INSIDE

In Depth — Move over, Unix: Here comes Mach! Page 97.

Executive Report — Wall Street tries to shed weight while building muscle. Page 75.

Secret Service crackdown scoops up thousands of computer disks, but details on scope of hacker case remain sealed as nationwide investigation continues. Page 128.

Novell, Banyan take different tacks to position their products against Microsoft's LAN Manager. Page 10.

Doesn't make the grade: IBM offers low-end 286-based PS/2 to education market, but academic computer managers say system won't gain admittance. Page 128.

PC-size VAX? DEC official responds to user queries at DECUS with hints of upcoming systems. Page 8.

Who was endorsing whom when IBM and DEC showed up at Computer Associates' coming-out party for CA '90s? Page 25.

AT&T lowers entry cost of its graphical workstation-based network management system. Page 129.

Don't look back is the theme at Epoch Systems, which has gone through a boom year in its storage market niche. Page 103.

Windows pulls Lotus into corner

Multiple 1-2-3 choices could confuse market

BY PATRICIA KEEFE
CW STAFF

BOSTON — Bowing to user pressure and the anticipated impact of Windows 3.0, Lotus Development Corp. surprised no one last week when it said it will port its 1-2-3 spreadsheet to Microsoft Corp.'s Windows environment, probably in 1991.

Also driving that decision is the fact that "the pace of OS/2 maturing hasn't been sufficient," acknowledged Frank Ingari, vice-president and general

---

The 3 faces of Lotus
The firm will sell multiple high-end versions of 1-2-3

▶ Release 3.0, currently the high end of Lotus' DOS spreadsheet family, will be supplanted in September by Release 3.1

▶ 3.1 will run native under DOS, in character mode under OS/2, and in full screen mode under Windows

▶ '1-2-3/W' should ship sometime in 1991 as a full-function Windows application

▶ 1-2-3/G, implementing the full OS/2 Presentation Manager, shipped in March

---

manager of Lotus' PC Software Division. The spreadsheet maker first hinted three weeks ago that it might "reassess" its strategy regarding Windows [CW, April 23].

Lotus will nonetheless continue to promote OS/2 — which it expects will run neck and neck with Windows in personal computer shipment sales by 1992 — as the better environment, Ingari said.

Officevision birthday blahs

BY ROSEMARY HAMILTON
CW STAFF

Where there is smoke, there is not necessarily fire — or so IBM's Officevision story shows.

One year after the hot debut of its first Systems Application Architecture application, this integrated set of office tools seems stuck in evaluation mode at many user sites instead of becoming a real piece of their information systems structures.

While some users have adopted the initial capabilities of Officevision in Release 1.0 (see story page 129), others remain unconvinced that there is anything to buy into.

"I have yet to find one single feature [in Officevision] that we haven't had for years," said George Sekely, vice-president of computers and communications at Canadian Pacific Co. "When you remove the surface, it's just VM and Profs. This is 1990s wallpaper on peeling 1970s plaster."

Still smoldering

Most industry observers did not expect Officevision to quickly set the market ablaze, because IBM has positioned it as a long-term strategic product. IBM prefers to focus on the long-term objectives and considers Officevision's first year a success in that it was established and met its delivery deadline for Release 1.0.

The purpose of Officevision is twofold. First, Officevision is designed to provide an integrated set of traditional office tools, such as electronic mail, that are intended to be consistent across the four SAA platforms.

Second, it is meant to serve as the central point at which an end user can access applications, move data among them and use that information with a host of office tools.

"Why would someone buy a

Focus turns to consumer rights

At Issue:
PRIVACY

BY MITCH BETTS
CW STAFF

After several years on the back burner, the privacy issue is heating up as the public, consumer advocates and legislators grow concerned about businesses compiling databases on consumer financial transactions and lifestyles.

During the next five weeks, privacy will be the subject of three congressional hearings, a Lou Harris Associates opinion poll and a conference hosted by the National Consumers League. Furthermore, a U.S. House of Representatives panel is preparing to write legislation beefing up the privacy protections in the Fair Credit Reporting Act of 1970.

"It's probably one of the critical issues of the '90s. Actually, we've already lost the war on privacy. Now the question is how to begin to reclaim some of the lost ground," said Steven W. Hamm, administrator of the South Carolina Department of Consumer Affairs.

"The ability to combine several different databases of relatively innocuous information into a detailed profile of an individual consumer poses a very real threat to consumer privacy," said Bonnie Guiton, who is director of the U.S. Office of Consumer Affairs and the consumer advisor to

Leasing abuses charged

Industry cleanup exec cites 'immoral' practices

BY NELL MARGOLIS
CW STAFF

ORLANDO, Fla. — The man who has been called upon to clean up the computer leasing industry's most spectacular failures is warning industry executives that too many of them may be conducting business on the shady side of the law.

Without naming any names, James P. Hassett took the podium at the semiannual meeting of the Computer Dealers and Lessors Association earlier this month and said that some companies are engaged in abuses that are "surely immoral" and, in some cases, of dubious legality. Hassett, as a court-appointed trustee, has now overseen the reorganization of four fallen leasing companies, including the fraud-ridden O.P.M. Leasing Services, Inc.

Hassett cited questionable practices, including the selling of computers without benefit of holding legal title and the stripping of systems to sell or lease their parts without properly accounting for the transaction.

Hassett's warning came at an opportune time. Even as he gave his address earlier this month, the fate of New York-based Atlantic Computer Systems, Inc. — a $195 million leasing firm widely thought to be in sound fiscal shape — hung in the balance as its UK-based parent company careened from its place as the

Aftermath

Bob Mahoney

Robert T. Morris *remained tight-lipped after his sentencing for Internet worm conviction, as others debated adequacy of sanctions. Page 128.*

IN THIS ISSUE

Quotable

"**W**hen you remove the surface, it's just VM and Profs. This is 1990s wallpaper on peeling 1970s plaster."

GEORGE SEKELY
CANADIAN PACIFIC CO.

*On IBM's Officevision.
See story page 1.*

Is it any surprise that 29 of the top 100 — as well as six of the top 10 — companies on *Business Week's* "Best Small Companies" list this year are in the computer field? The list includes hot young upstarts, such as Tseng Laboratories and Cabletron Systems, as well as such old favorites as BGS Systems and Goal Systems International. Best niche strategy has to belong to Electronic Data Technologies, a maker of video gambling systems. And the fact that Rainbow Technologies lands at number 30 on the list makes a bittersweet statement about the industry. Rainbow sells systems and software that prevent software piracy.

Steve Murek/Blackstar

Future hospitals will be based on modular, distributed systems, according to a permanent exhibit and research laboratory sponsored by Andersen Consulting. Page 18.

With inspirational Louvre architecture as a backdrop, PC manager Alain Vignon envisions a PC networking architecture for Paris-based construction firm Dumez Group. Page 43.

EXECUTIVE BRIEFING

■ **Clean up your act,** computer leasing industry executives were told at their biannual conference. James Hassett, the trustee for the bankruptcies of O.P.M., Itel and now CIS, chided CDLA members for creative accounting practices that are immoral, if not illegal. **Page 1.** To avoid the financial risks of less-than-honest lessors, IS directors who lease computers should look beyond low rates and beware of a deal that is too good to be true — it probably is. **Page 6.**

■ **IS managers at investment banking and brokerage firms** are in a quandary, caught between a cost drought and expanding needs for new systems. Some are counting heavily on downsizing to alleviate the resource crunch, and many are requiring that all new project requests pass through review boards. A big challenge for all financial services firms will be devising new strategies to replace outdated products and valued-added services that computer-equipped customers can now perform for themselves. **Page 75.**

■ **Systems development directors are frustrated** by a lack of real user commitment to development partnerships and lingering perceptions of their staffs as too techie. An Index Group survey also revealed that the use of CASE tools is mainly experimental, and CASE is not a panacea for faster and better development. **Page 4.**

■ **Database marketing and the increased value of information** are raising a slew of new issues regarding consumer privacy. Federal and state legislators are gearing up to scrutinize many private-sector business practices, ranging from phone number identification to mailing list referrals. **See stories pages 1, 127.**

■ **Banks have the potential to be key players in EDI,** but laggards risk falling far behind the leaders. Some banks have already emerged as "EDI matchmakers" to compete with such vendors as GEIS. **Page 14.**

■ **Frito-Lay looked to the sky** and will install a satellite network from Scientific-Atlanta. The planned nationwide network of 300 VSATs will support Frito-Lay's large executive information system, which had the potential to overload the firm's land-based network. **Page 6.**

■ **One year later,** where is IBM Officevision? Many users say IBM's first SAA application is far from being the breakthrough integrated office package first promised. Lack of support for Unix and multivendor environments, as well as the delay of Release 2.0, are big problems. **Page 1.** Meanwhile, some IBM software partners are also frustrated and proceeding with their own SAA applications. **Page 129.**

■ **IS work may lend itself better to telecommuting** than other functions do, and many IS departments are forging ahead with programs that allow employees to work from their homes. But observers say telecommuting will not take off until sophisticated groupware packages and more powerful PCs become more commonplace. **Page 67.**

■ **On-site this week:** Boston's public television station, WGBH, powers its fund-raising drives with a DEC VAX 8550. The CPU tracks 1.5 million donor records and contributions that totaled more than $15 million last year. **Page 29.** To help determine the creditworthiness of some 200,000 retailers, Dun & Bradstreet calls on an expert system. Based on a shell from Inference Corp., the 1-year-old system is the first expert system at D&B's Credit Clearing House in Murray Hill, N.J. **Page 30.** France's second-largest construction firm has built a large Compaq network. The Paris-based Dumez Group recently invested in two Compaq Systempros as servers for some of its networks of 250 PCs. **Page 43.**
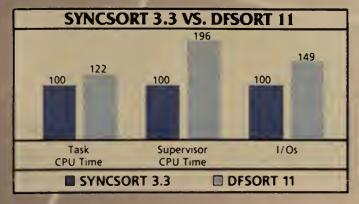
Systems developers frustrated
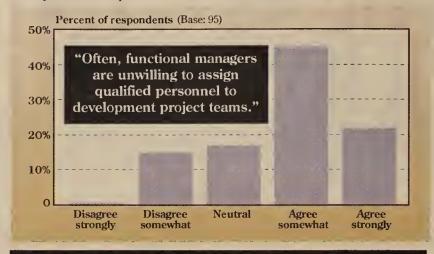
BY CLINTON WILDER
CW STAFF

CAMBRIDGE, Mass. — These are not easy times for systems development directors — and computer-aided software engineering is doing little to improve things.

The increased demand to build strategic or cross-functional systems and the unfulfilled promise of new CASE tools to help build them have caused much frustration, according to an Index Group, Inc. survey of systems development directors released last week. In January, Index's Summit research unit surveyed 95 directors in the U.S. and Canada working at firms averaging $6 billion in sales and $12 million in annual development budgets.

Survey respondents were particularly frustrated by the ineffectiveness of the ballyhooed partnership between developers and functional users. Two-thirds (67%) said they believed that line managers are unwilling to assign qualified users to project development teams, while 64% said that getting different units to share data across functions was "a major problem."

"We've been hearing that it's hard to build cross-functional systems, and those perceptions are borne out by the numbers," said Nicholas Vitalari, director of Summit and associate professor of MIS at the University of California at Irvine's Graduate School of Management. "It's not just a few firms here and there having this problem; it's across all industries."

Another major problem, directors said, is the lingering perception of the systems development function as technology-rather than business-oriented. Seventy percent of respondents said the function is often viewed by users as "the purveyor of technical rather than business solutions," and 47% said their departments are viewed as an overhead item.

Belying those perceptions, few development directors said they view CASE technology as a top priority. Implementation of CASE tools ranked just 14th on their list of the top 20 systems development issues for the 1990s. The top three issues were developing an information architecture, achieving support for cross-functional systems and strategic systems development.

"Other issues are far more pressing than CASE," Vitalari said. "The real major issue is cultural transformation and making developers more business-oriented. That shows that systems development directors are thinking more like managers than technicians, which is a very positive thing."

High hurdles
Systems development directors are frustrated by traditional perceptions and inadequate user cooperation

"Often, functional managers are unwilling to assign qualified personnel to development project teams."

Percent of respondents (Base: 95)

Source: Index Group, Inc.　　　　CW Chart: John York

Users bypass war over distributed standards

BY ELISABETH HORWITT
CW STAFF

MOUNTAIN VIEW, Calif. — With yet another standards tiff brewing in the Unix arena — this time in the area of distributed computing — some users indicated they will ignore the sounds of battle and bring in whatever seems to get the job done.

Sun Microsystems, Inc. threw down the gage two weeks ago by announcing its long-term plans to support and enhance its Open Network Computing (ONC) system "as the de facto standard," no matter what the Open Software Foundation (OSF) chooses this week as the official distributed computing standard.

The OSF is widely expected to choose the Decorum proposal — offered by a group that includes IBM, Hewlett-Packard Co., Locus Computing Corp. and Transarc Corp. Users with immediate distributed computing plans could face the dilemma of choosing between a widely installed "de facto" standard and an "official" standard that is likely to have far broader industry support when it matures in two to four years, according to Steve Wendler, a program director at Stamford, Conn., research firm Gartner Group, Inc.

However, users said that the state of the standard will have little to do with their long-term distributed computing choices. "I don't believe we'll run to Decorum simply because OSF codifies it," said Edward Zaharewicz, a systems architect at The Putnam Companies.

Right now, the Boston-based investment firm's distributed computing environment makes use of the complementary strengths of both Sun's Remote Procedure Call (RPC) — which is the basis of Sun's distributed platform — and the HP Apollo Division's Network Computing System (NCS), which forms the nucleus of the Decorum proposal. While Sun's RPC "does have broader multivendor support," NCS has more functionality in such areas as locating resources on the network, Zaharewicz said.

Charles Schwab & Co. is still evaluating whether RPC technology is the right foundation for its distributed application platform, "but we will make our choice on the basis of whatever gives us the best multivendor interoperability, not what OSF chooses," telecommunications analyst John Payne said.

The one component of Sun's ONC that has a claim to de facto-standard status is Network File System (NFS), Wendler said. NFS, which is also a major component of Sun's submission to the OSF, reportedly is installed on 1.2 million nodes. However, the fact that Sun's RPC technology was developed originally for NFS is a minus rather than a plus, given that users want a distributed computing platform that goes well beyond file-sharing applications, Wendler indicated.

Sun has sought to enhance ONC's appeal through alliances that broaden its networking support and through recently announced enhancements (see story page 66).

Enhanced or not, however, Sun's ONC will be passed over by the OSF in favor of a combination of Decorum and DEC submissions, Wendler predicted. While DEC is not yet a formal member of the Decorum alliance, the company is "talking with Decorum and may support and contribute" to the system more strongly in the near future, according to DEC spokeswoman Jacqueline Kahle.

Users who go ahead and install Sun's distributed computing products now could have a difficult time bringing in Decorum in the future unless they have the foresight — and technical facilities — to develop their own "vendor-independent layer between their applications and RPC," Wendler said.

Some users see no problem with carving out their own strategies while they wait out the RPC wars. "It's great that there will be a recognized standard, at least on paper, but until it's accepted as such in the industry, it's just that — a paper standard," Zaharewicz said.

Rival camps
The leading candidates for the Open Software Foundation's distributed computing platform standard have lined up their allies
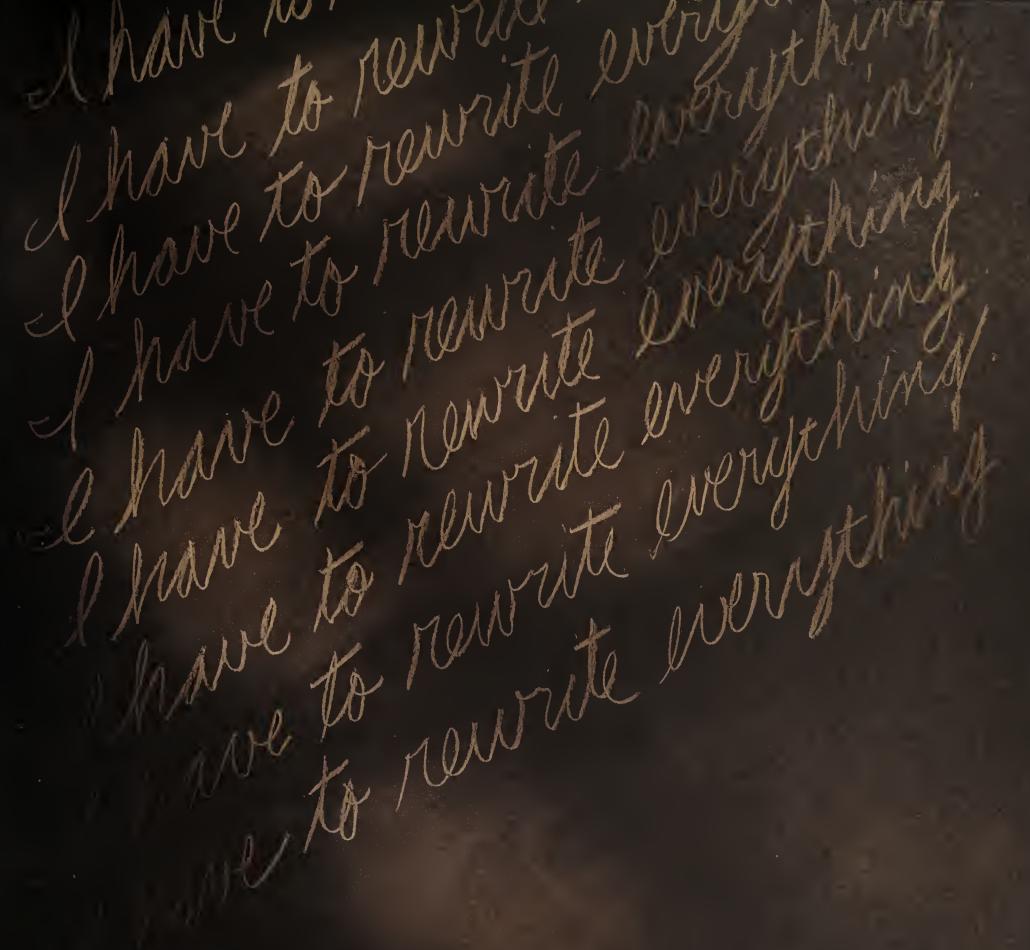

Sun Microsystems' Open Network Computing platform

Supporters: AT&T/Unix International, 3Com Corp., Novell, Inc., Banyan Systems, Inc., Netwise, Inc.

(More than 90 companies are shipping Sun's Network File System and/or Remote Procedure Call, which are major components of the Open Software Foundation submission)

Decorum

Hewlett-Packard Co., Locus Computing Corp., Transarc Corp.

(Both Microsoft Corp. and Digital Equipment Corp. are joint submitters and endorsers of several components of the submission)

CW Chart: Tom Monahan

CORRECTION

In an April 9 Product Spotlight article, Texas Instruments, Inc.'s Information Engineering Facility was incorrectly described as a full life-cycle product that started out as a set of non-integrated tools. In fact, IEF was originally designed as a fully integrated product.

The March 12 article "CA follows the integration trend" misidentified Unitech Systems, Inc. as Unitech Software, Inc. and incorrectly indicated that Unitech Systems bases its strategy on acquired rather than internally developed products.

I have to rewrite everything I have to rewrite everything I have to rewrite everything I have to rewrite everything I have to rewrite everything I have to rewrite everything I have to rewrite everything I have to rewrite everything I have to rewrite everything I have to rewrite everything I have to rewrite everything ave to rewrite everything e to rewrite everything

You Shouldn't Be Punished For
Moving Up To A Relational Database.

You should be rewarded.

With CA-DATACOM/DB® or CA-IDMS/DB® you can now have relational technology while protecting your current application investments.

Only CA transparency software offers you, the VSAM, DL-1, TOTAL or IMS user, the unique opportunity to run all your current applications in a relational environment without any rewriting.

Ultimately this saves you millions of dollars because existing applications that took hundreds, perhaps thousands of man hours to create are ready to use as is. The moment you switch over to high-performance CA-DATACOM/DB or CA-IDMS/DB you can unify all your data and applications into a single relational environment. With no expensive conversions. No relinking. And no recoding.

What's more, CA relational database technology will protect your future investments with SQL support, compatibility and portability across multiple platforms.

Call Dana Williams at 1-800-645-3003 and find out how thousands of our clients moved up to a relational technology easily and economically. We promise it will be a rewarding experience.

COMPUTER ASSOCIATES
Software superior by design.

NCR to ship high-end systems with zip

But company's marketing woes could bog down products, analysts say

BY RICHARD PASTORE
CW STAFF

NEW YORK — NCR Corp. moved to solidify its presence in the high-end personal computer market last week, unveiling Intel Corp. I486-based systems and a 486 upgrade chip. However, NCR's sales force stands on shaky ground when it comes to marketing the products, analysts said.

The desktop PC and deskside server, to ship next month, are among the first with the 33-MHz 486 chip, the fastest Intel processor available. It delivers 32% faster performance than the 25-MHz version, Intel said.

"NCR is trying to break out of its mold as a vertical solution vendor and become a leading vendor of client/server .systems," said Paul Zagaeski, an analyst at The Yankee Group in Boston. "This [introduction] helps establish that presence."

The company also announced what it calls "I486 upgrade technology" for its 20-MHz Intel 80386SX-based PCs. By installing the $3,500 upgrade board, users of NCR's PC386SX/MC20 PC can achieve faster performance than a 33-MHz Intel 80386-based PC in most applications, NCR said.

"This is how we are helping users deal with their hardware uncertainties," said Alok Mohan, vice-president of workstation products at NCR.

Offering this kind of hardware flexibility and investment protection is a growing trend among PC vendors, analysts said. "It's a response to user demand to prevent early obsolescence," Zagaeski said.

Although they were not sure they would take advantage of it, NCR PC users praised the upgrade. "I think it's a good idea," said Dennis Melville, vice-president of information services at Big V Supermarkets in Florida, N.Y. "We're putting in larger disks and memories, so the capability to kick it up to a faster box is desirable."

"It gives the user more flexibility," said Toys 'R Us data center director Paul Gallico, who said he feels more comfortable knowing NCR offers such an upgrade path.

However, analysts are not comfortable with NCR's ability to sell new accounts on the upgrade and high-end PC technology. "The most difficult thing will be to market the upgrade. For a long time, they couldn't even decide what to call it," said Robert Cameron, associate director of northeast research at Dataquest, Inc.

NCR's new desktop strategy, dubbed Open Cooperative Computing, "is a difficult concept for anybody to sell," especially for a sales force most used to peddling vertical systems, Zagaeski said.

Another potential problem is brewing in Businessland, Inc. stores. When NCR signed a much-touted reseller contract

Mini makers' micros

NCR's 27-MIPS desktop system and server employ a speedy I486 microprocessor

CPU	Intel Corp. I486, 33-Mhz
I/O bus	IBM Micro Channel Architecture
Memory	4M to 64M bytes
Hard disk	Desktop: 100M/200M/320M bytes Server: 200M/320M/640M bytes
Graphics	Super VGA
Base price	Desktop: $14,195 Server: $16,195

Source: NCR Corp.   CW Chart: John York

with Businessland last November, it was hoping to fill the shoes left vacant when Compaq Computer Corp. pulled out of the retail chain last year, analysts said. Compaq's recent return, however, has thrown cold water on NCR's aspirations, analysts said.

Frito-Lay to crunch a bunch of bytes over satellite net

BY SALLY CUSACK
CW STAFF

DALLAS — Driven by new applications, including an executive information system (EIS), that were going to double demands on its existing land-based network system, Frito-Lay, Inc. has signed a contract with Scientific-Atlanta, Inc. for the installation of an extensive satellite network.

Scientific-Atlanta will install and maintain the turnkey Skylinx X.25 very small-aperture terminal (VSAT) satellite network designed to transmit information to and from the 10,000-person sales force and connect all 300 U.S. manufacturing, sales and distribution locations for the snack food maker. Frito-Lay, a subsidiary of Pepsico, Inc., posted $4.5 billion in retail sales last year.

The network will reportedly include a 7-meter master earth station located in Dallas and 300 two-way 1.8-meter VSATs. The vendor will handle all satellite transponder services for five years, under the terms of a 24-hour-per-day facilities management contract.

According to Dan Smith, Frito-Lay's MIS communications consultant, the company was very satisfied with its 9.6K bit/sec. AT&T multidrop land-based network, but the addition of an EIS and several other advanced applications would require true peer-to-peer communications capabilities.

"We have a very sophisticated information architecture," Smith said. "It is essential that we move large databases back and forth between locations."

The company examined every possible solution, Smith said, including Tariff 12, fractional T1 and AT&T's Spectrum, and considered a total re-engineering of the existing multidrop network.

"We were surprised we ended up with VSAT," Smith said.

There are currently a dozen pilot sites up and running on the new network, and Scientific-Atlanta estimated that the entire installation will be completed by September. The system provides X.25 standards-based architecture and is built on packet-switching technology — features that were pivotal in cinching the Frito-Lay contract, Smith said.

The CCITT Skylinx X.25 architecture supports four link protocols at each remote site and is also capable of LAN-to-LAN communications. This permits the development of automatic dial-up recovery to restore individual site failures by reconnecting failed locations to the hub packet switch and allows a normal site failure to be recovered by the hub without intervention by the host, Smith said.

Scientific-Atlanta will also provide a backup hub capable of restoring the entire network.

Arni Katz
Frito-Lay's *satellite network makes tracking snacks easier*

Leasing

third-largest computer leasing company in the world into sudden and huge insolvency. As of last week, Atlantic PLC estimated its loss at more than $1 billion.

The computer leasing industry, heavily dependent on IBM equipment, has been reeling from the success of IBM's own leasing arm, IBM Credit Corp., which is currently wolfing down an estimated 50% of the approximately $24 billion U.S.-based computer leasing market and gives every sign of being hungry for more.

"Basically, IBM Credit is the problem for all us," said one leasing company asset manager. "But this," he added, citing Hassett's warnings, "is pretty scary."

Users lose when lessors smudge moral and legal lines, Hassett said. Such practices are warning signs of an unstable leasing company, and if the lessor collapses, their customers may be pitched headlong into confusion as to their rights and obligations, he said.

Leasing deals are by nature a Byzantine morass of contracts, subcontracts and side deals transacted among various financing sources and investors to provide attractive equipment usage costs. The equipment user may not even be aware of all the parties involved in the financing, which is often sealed by documents that few can understand. At any given moment, the computer lessee cannot be certain which party holds what papers and who owes what to whom. "Do I feel jeopardized? Of course I do; common sense alone would see to that," said an Atlantic user who requested anonymity.

For the leasing companies, the upshot of a continued walk on the wild side could be even worse than the collapse of major leasing firms, Hassett said. "He who sells what isn't his'n, pays the price or goes to prison," he said, quoting an old childhood rhyme.

Hassett made it clear that the abuses he detailed were not confined to a few troubled firms. Furthermore, he said, "I know of at least one U.S. attorney who is looking into this right now." He urged CDLA's industry practices committee to do the same.

An analyst close to the computer leasing market who requested anonymity affirmed that practices such as those detailed by Hassett, while not universal, are frequently found.

Kenneth Steinback, chief executive officer of St. Louis-based Computer Sales International, Inc. and chairman of CDLA, said that both the professional association and his own leasing firm are still in the process of sorting out Hassett's accusations. Any comment from either, he said, would be premature.

"However, if you want one man's opinion," Steinback said, "I think that [the Hassett address] raised some important points but was very, very, very exaggerated."

One leasing industry analyst, Thomas Donovan, director of information strategies at Framingham, Mass.-based Technology Investment Strategies, Inc., said that if there is rampant wrongdoing within the leasing arena, he is unaware of it.

What there is, Donovan said, is a great deal of aggressive business dealing and accounting, none of which is unlawful, provided that it is accurately accounted for on the company books.

"There's no black and white on a lot of these issues," Donovan said. "There's mainly a lot of grey."

Signs of trouble

Some of the questionable practices cropping up in the leasing industry leave end users liable to more than one party for the same computer equipment — sometimes for computers not even on the premises, warned James Hassett, an expert at leasing company reorganization.

Fortunately, there are warning signs of a leasing company in trouble, Hassett said. He offered tips for prudent lessors:

● **Eliminate the consistently lowest bidder.** The deal that looks too good to be true usually is. "I know one company that consistently selects the lowest bidder," he said. "It's now caught up in its second [lessor] bankruptcy situation, and it's paying dearly."

● **Check out the chief financial officer's clout.** Lack of financial discipline has characterized virtually every leasing company that has gone south, regardless of the route it went by.

● **Do not give in to greed.** All too often, lessees and lenders who get sideswiped as a leasing company falls were complicit in their own injury in that they blinded themselves to intuition and common sense in the name of the bottom line. "Lessees are greedy for the best deal; lenders are greedy for the highest deal," Hassett noted.

NELL MARGOLIS

Introducing the best thing to happen to systems and network management since NET/MASTER.™

NET/MASTER from Systems Center.

Ever since its introduction, NET/MASTER has earned high praise for its unique combination of integrated network management, automated operations, network control language, and out-standing ease of use.

Now NET/MASTER has even more to offer: the worldwide resources of Systems Center—a proven leader in systems and network software, and a responsive vendor with a history of innova-tion and commitment to customer partnership.

NET/MASTER is already making great things happen at nearly 2000 installations. To see what it can do for you, contact Systems Center, Inc., 1800 Alexander Bell Drive, Reston, Virginia 22091, (703) 264-8000.

A New York Stock Exchange company.

SYSTEMS CENTER

NEWS SHORTS

Wait goes on for System 7.0

Apple Computer, Inc. officials confirmed last week what third-party developers have suspected for months: Apple's upcoming System 7.0 operating system will not be available until the end of the year at the earliest. Apple had hoped to get the new version out by summer and gave no specific reason for the delay when it was announced at a software developers conference. Some insiders said Apple has put development in neutral to see what Microsoft comes up with next Tuesday when it plans to introduce a new version of its Windows interface.

. . . .

Xerox loses Apple suit

The last remaining count in the lawsuit over the technology behind the icon-based graphical user interface employed in Apple's computers was dismissed last week. Xerox Corp. filed the suit in December 1989, asking the court to cancel Apple's patent registrations and charging that the company is profiting unjustly from work that Apple founder Steve Jobs did in a joint project with Xerox.

. . . .

Motorola targets multimedia

Motorola, Inc. hopes to begin riding the wave toward multimedia applications today with the introduction of an auxiliary processor designed for the demands of applications that offer both high-quality sound and color graphics. The 32-bit 96002 floating-point dual processor is based on the same architecture as Motorola's 56001 24-bit fixed-point processor. Volume shipments of the 96002 will begin in the fourth quarter.

. . . .

E-mail directory forum established

When representatives of 16 corporations met at Western Union Corp. headquarters in Upper Saddle River, N.J., late last month, they agreed to form an industry forum to develop an electronic directory service based on the CCITT X.500 recommendations. Plans call for the forum to meet quarterly to complete an aggressive program that will lead to full commercial availability of a North American electronic directory service.

. . . .

AT&T upgrades Systimax

AT&T last week introduced a new cable for its Systimax Premises Distribution System said to support speeds of at least 20M bit/sec. over distances of up to 328 feet from the wiring closet. Systimax 2061 unshielded twisted-pair cable is designed to interconnect high-speed token-ring workstations through the Systimax wiring hub. Meanwhile, AT&T approved Proteon, Inc.'s Pronet 4/6 network interface cards for use with Systimax, according to Proteon.

. . . .

IBM to supply Amadeus

IBM recently won a bid worth an estimated $400 million to sell as many as 55,000 Personal System/2s to the Amadeus travel reservation consortium. The contract is one of the largest volume deals in IBM's history, a company spokesman said. Madrid-based Amadeus will resell the systems to travel agents and partners across Europe. Amadeus' international partners include Air France, Lufthansa and Iberia Air Lines of Spain. The range of PS/2 models will be configured with Amadeus' travel agency management software running under DOS, OS/2 and Unix.

. . . .

AT&T offers cut-rate ISDN link

Seeking to make Integrated Services Digital Network (ISDN) economically attractive to residential and small business users, AT&T and Micom Communications Corp. last week announced a $500 ISDN adapter for IBM Personal Computers. The Personal Computer Terminal Adapter Model 1000 does not take full advantage of the ISDN Basic Rate Interface in that it supports only voice on the two 64K bit/sec. B channels, allocating data transmissions to the 16K bit/sec. D channel. A more powerful and functional ISDN adapter costs about $1,400.

Of worms and wars at DECUS

BY MARYFRAN JOHNSON
CW STAFF

NEW ORLEANS — Amid the usual pomp and nonsense of trade show exhibits, some 6,500 Digital Equipment Corp. customers gathered last week to swap war stories about everything from network security and personal computer networks to the wars between DEC and IBM.

While no single issue dominated the semiannual Digital Equipment Computer Users Society (DECUS) meeting, there was intense interest in network security in the wake of the Robert T. Morris sentence for his worm program that paralyzed several thousand computers on the Internet research network.

"A lot of the folks I've talked to think the [Morris] sentencing was too lenient because there was no jail time. That sends a bad message on computer crime," said Robert Weston, a research engineer at NASA Langley Research Center in Hampton, Va.

Security problems were cited frequently by VAX/VMS users as the major stumbling block to acceptance of Ultrix, DEC's version of the AT&T Unix System V operating system.

Users were also keenly interested in a promise from DEC Vice-President Dominic LaCava that the company will deliver a PC-sized VAX, possibly by the end of the year.

During a question-and-answer period following LaCava's keynote address at DECUS, one customer asked when he could count on a fully configured, stand-alone PC running VMS. "Right now, you'd have to mortgage your house to get that," said Dick Gilbert, mechanical engineer at Princeton University.

Desktop VAX

LaCava responded that "far lower cost VAXs for the desktop" were coming. However, when pressed by other users about a laptop computer running VMS, LaCava said DEC would have to get more feedback from users about demand for laptops.

"If I had a VAX at home, I'd be a happy man," declared Robert Moss, a physicist and systems manager at Texaco, Inc. in Houston. "MS-DOS is the pits when you're used to programming on a VAX."

DEC officials made much ado about celebrating the 20th birthday of the old 16-bit war-horse PDP-11 minicomputer, introducing two new systems, the PDP-11/93 and 94.

"This is a nice life-cycle extension," said Bill Brindley, president of the users society and a systems manager at the U.S. Naval Security Group in Washington, D.C. "It could amount to a real cost savings for a number of organizations."

As always, the perennial issue of IBM vs. DEC competition cropped up frequently in conversation.

"We're seeing a more prominent role for VAXs," said Ernie Meier, systems manager at the Kerr-McGee Corp. in Oklahoma City. The company recently ordered a VAX 6000 Model 410 to run new manufacturing software and expand a three-machine Vaxcluster.

Windows

The only hitch in Lotus' embrace of Windows is a two-phase approach that may overwhelm Intel Corp.-based personal computer users, who will find themselves forced to choose from as many as four versions of 1-2-3 over the next 12 months, all of which support DOS, three of which offer some level of OS/2 support and two of which offer some level of Windows support.

In addition to a full-blown, future Windows implementation, which some have dubbed "1-2-3/W," Lotus also announced 1-2-3 Release 3.1. Available in September, it corrects the debilitating lack of publishing functionality in the barely 1-year-old Release 3.0, which it also replaces. It also gives Lotus a quick opening into the Windows market by offering a limited plate of Windows capabilities.

"Release 3.1 will be an exciting product. A lot of our people are still running 2.2 precisely because 3.0 lacked its publishing capabilities," said Sheldon Laube, director of information and technology at Price Waterhouse.

Lotus executives offered few details about the company's statement of direction for the Release 3.1 follow-up, 1-2-3/W. But sources close to Lotus said they were told to look for it in the first half of 1991.

"We are already flirting with the edge of vaporware," Ingari acknowledged. "The only reason we are announcing now is that there is so much hype and confusion around this new Windows release [3.0] that our customers need to know now.

"It's only 5% of the market, but Windows creates 50% of the noise," Ingari quipped.

In the short term, Lotus expects the 1-2-3 Release 3.1 to grab some sales by placating demand for Windows support.

The planned September release of 1-2-3 Release 3.1 will support DOS 3.0 and Windows 3.0. It will be followed by a character-mode OS/2 version. Key to 3.1 is the addition of sorely lacking desktop publishing and graphics capabilities via Impress, technology Lotus purchased from a French company called Aleph 2. "Impress goes totally beyond publishing; it gives us an advanced graphical spreadsheet," Ingari said.

Not Allways

In turn, Lotus has scrapped plans to further evolve the Allways publishing technology used in Release 2.2.

Release 3.1 runs as a "well-behaved" DOS application in full-screen mode under Windows 3.0. Users can launch it from an icon, task switch between applications without having to boot one of them down and take advantage of Windows 3.0's memory management scheme, as well as cut, copy and paste from Windows' clipboard.

In addition, the incorporation of the DOS Protected Mode Interface will ensure support for Windows multitasking and use of virtual memory.

1-2-3/W will have at least the functionality of Release 3.1 as well as the look and feel of the 1-2-3/G Presentation Manager interface, Ingari said. Sherlund predicted that 3.1, an "interim product," will "get squeezed out," once 1-2-3/W ships.

1-2-3/W will offer full functionality in sizable windows, support Microsoft's Dynamic Data Exchange protocol and use an IBM Common User Access-style interface.

Ingari dismissed the views of critics such as Nancy McSharry, an analyst at International Data Corp., who said Lotus may find itself confusing one audience with four choices: 3.0, 3.1, 1-2-3/W and G.

"Users have so many operating system and hardware environments to choose from, Lotus is forced to offer multiple versions," Ingari responded. "Let the customer choose and exert pressure on the operating system providers, and we'll make our products available on whatever they want to buy."

Laube, for one, is not confused. He said Price Waterhouse will take advantage of Release 3.1, 1-2-3/W and, in the longer term, 1-2-3/G. He said he expects to wind up with a shop split between 1-2-3/W and 1-2-3/G.

The reason for Lotus' dual approach with Release 3.1 and 1-2-3/W is twofold, Ingari said. "We wanted to get to market quickly with something supporting the upcoming version of Windows that would ship [close to when] it does," he explained, referring to Release 3.1. That goal prohibits Lotus from offering a full Windows implementation off the bat.

Closing Arguments

Only ORACLE supports virtually every vendor's software, hardware and network.

Today, some software companies claim that their software products are "open." They may even graft the word onto their product names. It is a confusing situation, but a clear definition of "open" is finally emerging.

Software is "open" only if it adheres to industry standards and works with products from other vendors.

More specifically, a database is open if it works with other vendors' databases. For example, ORACLE provides access to IBM's DB2, SQL/DS and DEC's RMS.

An open database should also work with other vendors' applications. ORACLE works with DEC's All-in-1, DG's CEO, IBI's Focus and SAS. And it supports PC and Mac software like Lotus 1-2-3, WordPerfect, Borland's Paradox and Apple's Hypercard. Even Dbase applications run on ORACLE.

Software is open if it runs on every vendor's operating system. ORACLE runs on MS-DOS, OS/2, Mac OS, UNIX, VMS, MVS and virtually every other operating system on the market.

And software is open if it supports every vendor's network. ORACLE supports IBM's LU6.2, LAN Manager, NetBIOS, DECnet, Novell's SPX/IPX, industry standard X.25 and TCP/IP and many others.

Choosing open software today lets users choose any vendor's hardware, software and network tomorrow.

Call 1-800-ORACLE1 ext. 8197 to sign up for an Oracle Database Conference near you. And keep your software and your options open.

Call 1-800-ORACLE1 Ext. 8197 to sign up for the Database Conference in your area.

ORACLE®

Compatibility · Portability · Connectability

Novell boosts Netware's OS/2 access

Requester upgrade includes full support for Named Pipes

BY JIM NASH
CW STAFF

Novell, Inc. moved last week to give Netware network users greater access to OS/2 applications by providing enhancements to its Netware Requester for OS/2 and its DOS shell.

The Provo, Utah, networking firm's Requester software for OS/2 Version 1.2 includes full support for Named Pipes. That, said Mark Calkins, vice-president of Novell's Netware products division, provides users with "totally transparent" access to SQL servers, including a listing of all SQL servers on the network.

The enhanced Requester, which is expected to ship next month, gives users a choice between Microsoft Corp.'s LAN Manager network and Netware. SQL servers, which operate on IBM OS/2 boxes, had required LAN Manager networks.

"That's a biggie. That's good news," said Dave Hoisve, project director at the University of Utah's computer center. Hoisve, who has yet to see the new product, added, "We're in a position now where a few applications that are coming out require us to start introducing OS/2."

Tim Yates, an associate at W. L. Gore & Associates in Newark, Del., said his firm has served as a beta-test site for the new version.

"It's working very well," Yates said. "It is allowing the front end to talk to the SQL server over a Netware LAN without having to run LAN Manager." That flexibility, he said, could mean substantial savings.

Microsoft spokesman Collins Hemingway chose to focus on the potential that Novell offers for increasing demand for SQL Server, rather than the possible challenge to LAN Manager. "LAN Manager was engineered alongside OS/2, but if [Novell's announcement] were to somehow create a competitive advantage for Netware 386, we would move to stay competitive," Hemingway said.

Calkins said the enhanced version of Requester provides all the print services available to DOS and OS/2 clients. Previous versions, he explained, stopped at rudimentary print functions.

Novell said it will make Netware DOS Shell Version 3.01 available this month as a free upgrade. The new version sports extended and expanded memory, according to Bob Young, a product line manager at Novell. It will support the next release of Microsoft's Windows, he said.

The shell, which works with Novell's IPX transport, can be removed from the core and placed in higher memory, freeing 34K bytes of conventional memory. It frees 33K bytes of expanded memory.

Banyan signs on to LAN Manager

BY JOANIE M. WEXLER
CW STAFF

WESTBORO, Mass. — Long chided for being asleep on the marketing side, networking software vendor Banyan Systems, Inc. last week announced it will link up with market trendsetter Microsoft Corp.'s networking scheme.

As a result of a cooperative alliance with Microsoft, Banyan Virtual Networking Software (Vines) personal computer-based corporatewide networks and servers will interoperate with Microsoft's OS/2-based LAN Manager local-area networks, and developers will be able to write DOS- and OS/2-based network applications that can run on both Vines and LAN Manager, Microsoft's network operating system.

Bill Sheehan, network manager at the Commonwealth of Massachusetts Metropolitan District Commission, is running a Vines network but is not yet supporting OS/2. "If this announcement has any relevance for me today," he said, "it would be that the marketing division of Banyan — always its weakest link — is starting to pick up."

Banyan's marketing mistakes are typically described as the company not moving from its direct sales force to reseller distribution channels early enough and simply not "getting the word out" about how its technology advantage could support business solutions.
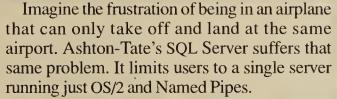
Mary Modahl, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass., said, "The good news for users is that all the three major network vendors [Novell, Inc., 3Com Corp. and Banyan] now support LAN Manager APIs, and independent software developers can focus on a set of applications for network computing.

"Microsoft's strategy is ultimately to compete with Banyan," Modahl said. "Banyan has a technology leap and a window of opportunity, and Microsoft's engineers are undoubtedly hard at work to shut that window."

Banyan's technology leap is its Streettalk global naming service, which allows users to access resources anywhere on a corporatewide Vines network — a more elegant solution to corporatewide networking than using interconnection products such as routers, bridges and gateways.

Pan Am/AT&T futuristic airport plan takes off

BY JOANIE M. WEXLER
CW STAFF

MIAMI — In one of its largest contracts to date, AT&T Computer Systems has landed a $40 million role in Pan American World Airways' emerging integrated data network.

The two companies announced last week that they have signed a five-year agreement under which AT&T will provide 10,000 Model 6386/SX and 6386/25 Workgroup Systems to about 100 Pan Am airport, reservation, operational and administrative locations worldwide. AT&T will also service and maintain other vendors' equipment in the airline's international network.

The personal computers will form the foundation for what Pan Am describes as its "airports of the future." Pan Am's plan calls for token-ring local-area networks at each airport connected with other facilities over an X.25 backbone.

The new network, which Pan Am started building several months ago, was designed to automate every point of contact between passenger and airline and thus reduce passenger wait times and slash Pan Am's operating costs by $15 million to $20 million per year, according to Robert O. Wagner, Pan Am's vice-president of information services.

AT&T won the PC leasing contract after a competitive bidding process that included IBM, NCR Corp., Unisys Corp. and Westinghouse Electric Corp., according to Wagner.

The stepped-up service goals Pan Am expects to achieve with its new network include reducing check-in time for passengers with tickets from the more than four minutes it now takes to between 1-1½ minutes, Wagner said.

Tickets and boarding passes will be combined and will contain magnetic stripes encoded with passenger and flight information to provide a continuous audit trail for the check-in function. Laser gun readers in the baggage makeup room will specify in a passenger's on-line record which container his bags have been loaded into. "FAA regulations state that if a person has not boarded, the airline must unload his bag," Wagner explained. "On a 747, which can have 20 containers of baggage, that could cause a two-hour delay. Now, we will be able to go right to the proper container."

Toshiba's Sparc laptop debuts

BY JAMES DALY
CW STAFF

Sun Microsystems, Inc. scored a victory last week in its bid to have other computer makers clone its technology when Japan's Toshiba Corp. announced the first portable workstation based on Sun's Scalable Processor Architecture (Sparc) microprocessor design.

However, analysts offered one bit of advice for those interested in getting Toshiba's Sparc LT laptop: Have a big lap.

The machine is heavy in both price ($13,200) and poundage (17.7 pounds) and is not scheduled to be available in the U.S. until early next year.

Instead, observers suggested the Sparc LT is a way for Toshiba to test the water for an entry into the desktop market. The Sparc LT "is really just a computer an engineer can use all day and then take home," said David Card, an analyst at International Data Corp. "If Sun thought there was a market for a laptop this year, they would have done it themselves. Neither company is fooling the other."

The Unix-based Sparc LT is essentially a stripped-down version of Sun's Sparcstation. Toshiba officials said the machine can process 13.2 million instructions per second and features a fold-up screen, 8M bytes of internal memory, a 180M-byte hard disk drive, a 3½-in. floppy disk drive and an LCD. It will reportedly be available in Japan in July.
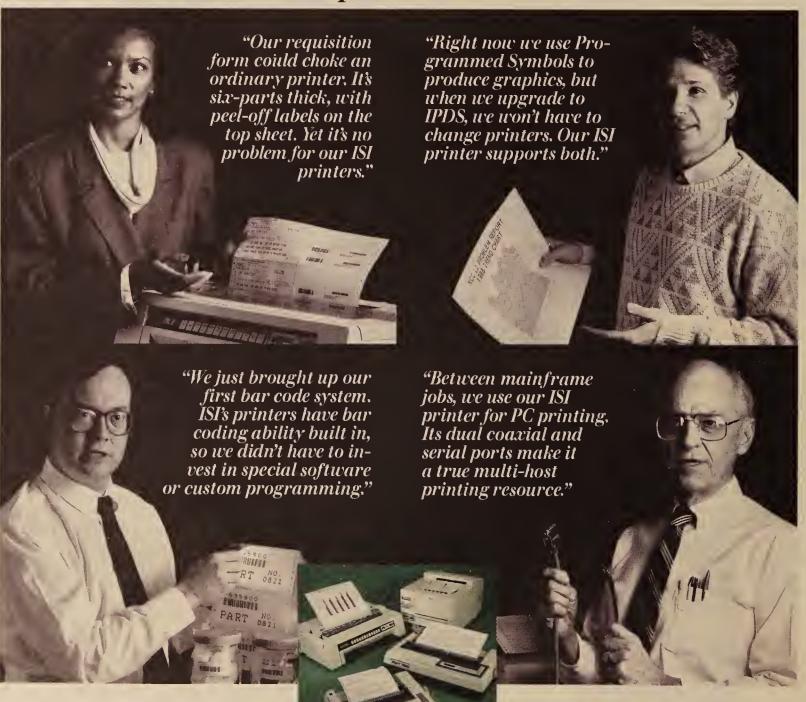
The model is the result of a May 1989 agreement between the two firms, under which Toshiba obtained the right to manufacture computers based on Sparc.

Analysts said the team-up makes a good fit, because Mountain View, Calif.-based Sun is able to offer the expansive software base that Japanese companies have traditionally lacked. "This could be a very big step for Toshiba, because it takes away a big headache in that it doesn't have to worry about building up a software base; it's already there," said Kathleen Hurley, an analyst at Dataquest, Inc.

Some experts have questioned the need for laptop workstations because the scientists and engineers who use them are often networked into high-powered mainframes. As a result, the advantages of portability are not as clear-cut as they would be for personal computer users.

Others disagree. "Most engineers already work ungodly hours, and they're looking for a machine they can bring home to finish up some spare business and enter into the system the next day," said Roger Ross, chief executive officer of Ross Technology, a subsidiary of Cypress Semiconductor Corp., which designed the Sparc LT's chip.

Making The Same Look Different

Applications built using Oracle Tools automatically adapt to multiple user interfaces.

Developing a program that runs on the entire spectrum of PCs, Macs, Suns and other workstations is next to impossible. Because each computer has its own graphic user interface (GUI), developers must spend months rewriting each application for each incompatible GUI.

Unless the applications are built with Oracle Tools.

Macintosh
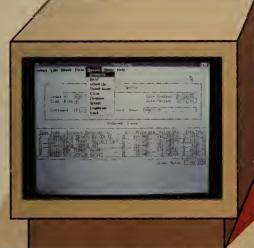
Character Mode

DECwindows/Motif

3270 Block Mode

Presentation Manager/ Windows 3.0

ORACLE

An application developed with Oracle Tools automatically adapts to the native look and feel of the computer on which it runs. PCs, Macs, Suns or other workstations. Even character and block mode terminals. All without changing a single line of code.

The key to this interface independence is Oracle's adaptable look and feel technology that translates "generic" interface operations into the native windowing system of different environments. So a single application can be easily deployed across an entire organization's PCs, Macs, workstations and terminals. All without recoding.

SQL*Forms 3.0 and SQL*Menu 5.0 will support both current and emerging interface standards. X/Motif, DECwindows, Macintosh, Presentation Manager, MS Windows, Next Step, as well as character and block mode terminals.

Call 1-800-ORACLE1, Ext. 8102 and receive the free Oracle Tools Information Kit. It includes demonstration diskettes and product information illustrating the full capabilities of SQL*Forms and SQL*Menu.

Developing applications will never be the same. Or different.

ORACLE®

Compatibility • Portability • Connectability

Banks being challenged to pick up EDI gauntlet

BY JIM NASH
CW STAFF

Banks, in their traditional roles as business midwifes and partners, have the potential to bring electronic data interchange (EDI) out of its incubation, industry observers said.

Those same observers were quick to add, however, that banks stand to lose much of their power and relevance if they ignore EDI.

That point was made repeatedly in the halls between sessions during last week's third annual Corporate EFT/EDI Con-

ference in Chicago.

Those institutions that decide to heed EDI are likely either to lead the way with new products and services or to follow the lead of others, said Ned Hill, a professor at Brigham Young University's school of management.

Followers, Hill explained, will

probably survive by purchasing EDI franchises such as those offered by the National Bank of Detroit, which franchises its services, equipment and expertise to other banks.

Banks are in an excellent position to promote, facilitate and even service EDI relationships

between companies, according to Hill.

While the institutions continue to play a smaller part in corporate financing, banks have an almost unmatched knowledge of individual businesses and their needs, he said.

Hill and others — including competitors of banks in the emerging data-centric marketplace — have said banks must capitalize on this knowledge or perish in the financial backwaters.

EDI matchmaker
Several banks have taken up the challenge. One, First Interstate Bank Ltd. in Los Angeles, has fashioned itself as an EDI matchmaker.

Randy Kahn, First Interstate's vice-president and manager, said that his company is now marketing added services that are tied to its EDI product, Action.

The new services basically amount to a search for logical and complementary trading

> THOSE institutions that decide to heed EDI are likely either to lead the way with new products and services or to follow the lead of others.
>
> NED HILL
> BRIGHAM YOUNG

partners, as well as consultation leading to appropriate EDI tools, Kahn said.

Robert Rosdorff, EDI product manager at First Interstate, said manufacturers and large retail distribution companies have traditionally targeted only current suppliers and those who are seeking to supply goods.

With the new services, he said, First Interstate will bring together partners that were perhaps unknown to one another before.

General Electric Information Services (GEIS), a value-added network company that competes with banks for transferring funds and sales-related data, supports First Interstate's move.

"There's a bank with its head screwed on," said Bill Cafiero, manager of corporate financial services at GEIS. "They are growing the industry."

First Interstate and GEIS worked together to develop GEIS' EDI software, called BPS Central.

Hill stated that First Interstate's program could qualify the bank as a leader in EDI's maturation. Someday, he said, it could put First Interstate on a par with current leaders First Chicago Corp., National Bank of Detroit Corp. and PNC Financial Corp.

The promise of AD/Cycle has just arrived three years ahead of schedule.

Why wait? Software AG's integrated CASE environment puts the promise of AD/Cycle to work for you now. While ensuring compatibility with emerging AD/Cycle technologies in the future.

Based on NATURAL, the world-class development technology, Software AG's CASE environment provides a modular, building-block approach to CASE implementation. So you can design, build and maintain a variety of applications—including knowledge-based systems—at your own pace. With the database you have now. No matter if it's DB2, VSAM, IMS, DL/1, SQL/DS or ADABAS on an IBM platform. Or RMS, Rdb or ADABAS on Digital's VAX.

The Software AG CASE environment covers all aspects of the application's life cycle—with analysis and design tools, code generation capabilities, repository-based management and integrated testing functions. All designed to work together. Now. The resulting applications are available through a consistent, easy-to-learn interface—with friendly features like active help, pull-down menus, windows and color graphics—that gives end users the information they want, the way they want it.

The integrated CASE environment from Software AG. Because tomorrow's promises can't solve your problems today. For more information, call 1-800-843-9534. (In Virginia, call 703-860-5050; in Canada, call 519-622-0889.)

Your success is how we measure ours.

SOFTWARE AG

How to give
your group

everyone in a workstation.

The new Apollo Series 2500.
Only $3990.

Everyone on your team needs a workstation. But not everyone can have one. They simply cost too much.

Hewlett-Packard has a better way.

The extraordinary Apollo Series 2500. As the industry's lowest-priced work-station, it offers the same features as work-stations that cost thousands more. 4 MIPS of UNIX® system performance. High-resolution graphics. And almost unlimited possibilities for standards-based networking.

All for only $3990.*

Hewlett-Packard can offer inspired solutions for all your team computing needs. To find out more, call 1-800-752-0900, Ext. 283C.

There is a better way.

apollo

A subsidiary of
HEWLETT PACKARD

ADVANCED TECHNOLOGY

Modular model of future health care

Heart of Andersen's Hospital of the Future is a decentralized computing structure

BY ELLIS BOOKER
CW STAFF

The hospital of the future will not include robotic nurses in white outfits dispensing pink pills to feverish patients. At least that won't be the case in hospitals automated by Andersen Consulting.

Two weeks ago in Dallas, Andersen opened its "Hospital of the Future," a permanent exhibit and research laboratory intended to demonstrate how some 20 vendors of clinical and administrative hospital systems can be tied together through networks and standard interfaces.

Like Chicago-based Andersen's other two integration exhibits — the $1.4 billion information systems consulting giant has similar centers for the manufacturing and retail industries — the $7 million hospital exhibit rests squarely on a belief in distributed computing.

Monolithic, mainframe-based hospital information systems, Andersen officials suggested, are going the way of the glass-enclosed data center; it is an approach to automation being made obsolete by cheaper, more flexible departmental and workstation computer platforms linked via local-area networks.

Decentralization devotees

So dedicated is the exhibit to the decentralized approach that it curiously does not include a connection to an IBM mainframe. Andersen officials said a "back-end" link to a Systems Network Architecture host is being considered.

"Hospitals are at a critical crossroads," said Jay E. Toole, Andersen's worldwide industry director for the health care consulting practice. He said new reimbursement structures, increasingly cost-conscious corporate payers, a skilled labor shortage and plain old competition have put hospitals nationwide on a crash course to improve their procedures — from the quality and speed of their billing systems to the quality and speed of their surgical teams.

However, Toole noted that hospitals are still behind other industries when it comes to investing in IS, typically spending approximately 3% of their annual operating budget — far less than the 8% to 10% spent by banks and insurance companies — on information technology.

"We think that for another 1% or 2% over the next few years, [hospitals] can begin to put in an architecture," Toole said.

Such a modular, distributed approach to hospital IS, Andersen argued, is a cheaper way to solve productivity and quality concerns because it allows each department to

Tom Monahan

deploy the best system available.

Technologies on display in the exhibit include home medical monitoring systems; handheld terminals for nurses; voice- and handwriting-recognition systems; communications gateways enabling physicians outside the hospital to check a patient's medical database via Integrated Services Digital Network telephone lines; high-speed fiber-based LANs for transmitting diagnosis-quality radiological images; smart cards able to store a patient's medical and insurance history on a microchip; and executive information systems for the hospital's management team.

Until now, however, the expense of writing interfaces between different vendors' medical IS has been prohibitively expensive. Enter Health Level 7, or HL7, an emerging application-level protocol that makes writing interfaces between different systems much easier (see story below). Nine of the 16 applications in the Andersen exhibit adhere to HL7, and Andersen officials said that in the coming months, most of leading hospital systems vendors will have an HL7 interface.

Connecting the HL7 programs was Symborg Systems' Stat Lan, a message referee for HL7 systems. The LAN runs over the Ungermann-Bass, Inc. implementation of the Xerox Network Systems protocol on a twisted-pair Ethernet.

To deliver a common interface among the remaining non-HL7 systems, Andersen used a terminal-emulation and user interface product from NCR Corp. called Access 2000. The software, running on an Unix-based NCR Tower Model 32/700 supermicrocomputer, connects HL7 and non-HL7 systems over a Transmission Control Protocol/Internet Protocol Ethernet network.

Throughout the exhibit, the user interface was graphical, in effect shielding the physician, nurse or hospital administrator from the fact that the information on the screen was being pulled from several databases throughout the hospital. One of the most interesting demonstrations of a graphical user interface was a "medical chart," an Apple Computer, Inc. Hypercard application that physicians outside a hospital can access from their remote workstation.

Attendees at a technology conference at the Infomart in Dallas sponsored by the The American College of Healthcare Executives, which will be the executive sponsor for the exhibit during the next three years, got a tour of the Andersen exhibit, and many said they were impressed.

However, many of these executives said they still worried about the ease with which different systems can be interfaced and, importantly, how they will be *synchronized* in the absence of a centralized database.

"If hospitals had to do it all over, they might use a core system approach," said Edward J. Pastor, IS director at Swedish American Hospital in Rockford, Ill. But for most institutions, he said, that is not an option, and they face the dilemma of integrating clinical department systems with the patient records and financial systems that have been purchased over the years.

For Executive Vice-President William Heath at Saginaw General Hospital in Saginaw, Mich., centralization was the answer. The 350-bed hospital is moving to upgrade its IBM 4341 to a 4381 and at the same time install a commercially available core system with departmental modules over the next 18 months. Even so, Heath is concerned about adding future clinical components, such as an electronic medical record. "Chances are we'll use another vendor . . . and I hope we'll be able to interface easily," he said.

United against incompatibility

Health Level 7, better known as HL7, was born out of the frustration of a group of hospital information systems users tired of the incompatibilities of their clinical and administrative computer systems.

The IS users banded together in 1987 — later adding hardware and software vendors and consultants to their ranks — to develop an open-architecture model for transmitting information between computer systems.

The current implementation of HL7 Version 2.0, was demonstrated in February 1989 at the American Hospital Association's Healthcare Information Management Systems Society conference in Anaheim, Calif. That demonstration linked the applications from seven vendors, all on different hardware platforms.

Andersen Consulting, which served as systems integrator on that demonstration, is a founding member of the group known as the Health Level Seven Standards Committee.

HL7 Version 3.0, due out later this year, will address other areas of the hospital, notably the financial and inventory systems, as well as expanded coverage of nursing and pharmacy systems.

Because it is application-level protocol — corresponding to the seventh and top layer of the Open Systems Interconnect protocol — HL7 is network-independent and computer architecture-independent. It defines the content and format of electronic messages, but not the network or computer architecture carrying those messages.

One of the most powerful aspects of the standard — and a critical feature for distributed environments — is HL7's definition of various trigger events to automatically update various databases throughout the institution. For example, after a new patient is logged into the patient admissions system, pertinent parts of the patient's medical biography will be sent to the laboratory and radiology systems.

ELLIS BOOKER

Tower of Pisa

The Spruce Goose*

The plan that couldn't stand on its own.

The plan that didn't quite fly.

Unfortunately, not all
as well as the AT&T *MEGA*

And now it'll pay off even more by saving you at least $900 a year.

Did you know the AT&T *MEGACOM* WATS Term Plan can save you $900 a year or more on outbound domestic calls. That's along with the 40% discount you're already receiving as a *MEGACOM* WATS customer.* Plus you'll get extra savings on international calls.

The Term Plan is so flexible that in most cases should your bill fluctuate by season, you can still save. Numerous discounts are available to suit your level of usage. You can

begin saving with an average monthly bill as low as $2,500. You also have the option of choosing an 18- or 36-month plan. Plus, for a limited time, we'll even waive the monthly service charge.

And if you're not currently using AT&T *MEGACOM* WATS, we'll also pay the installation and start-up fees.** But you don't have to wait for installation to start saving. Savings start as soon as your order is placed.

If you're with another company, we'll also pay the majority of the switchover fees. And if after 180 days you're not fully satisfied, we'll even pay to switch you back. With

EDITORIAL

Thumbs . . . up?

THERE'S A CAUTIOUS but distinct air of optimism circulating about the computer industry these days. Exactly why, we're not really sure.

More and more computer vendors are popping up on stock analysts' "buy" lists. The semiconductor associations are reporting order numbers that are being interpreted as a harbinger of better times just over the horizon. And earlier this month, IBM sounded a very optimistic note about business expectations.

Unfortunately, a look at the dynamics underlying user purchase decisions yields little reason to think any big changes in the U.S. market are forthcoming. Believe it or not, this could be good news for these users.

First of all, the general state of the economy is shaky. Unbelievable as it may sound, the "T" word is almost audible on the lips of President Bush. A continued inability to cut the defense budget makes new federal taxes almost inevitable for the federal government to meet mandated budget guidelines. Some state governments, too, are on the verge of significant tax increases, largely because of several years of federal aid cutbacks. Taxes do not walk hand in hand with economic growth and capital spending.

The inability of our education system to churn out enough qualified professionals is already putting upward pressure on the prime determinant of inflation — wage rates. Wage inflation and economic growth are also strange bedfellows.

Both the people for whom information systems services are provided (the user departments) and those who ultimately approve expenditures for IS outlays (corporate management) are increasingly questioning whether they are getting their money's worth. In separate studies of both groups conducted by *Computerworld*, only half the user department managers felt their companies have gotten good value for their IS expenditures; the corporate managers surveyed were even less convinced that they got their money's worth. These sentiments do not necessarily make for a favorable buying climate.

Yes, it's a dismal science — but not totally, because aggressive, continued price cutting is the only thing worth banking on at this point.

A chill wind

Surely Robert T. Morris' sentence is a chilling reality for those people whose jobs depend on the security of the systems they maintain. These managers know that any system can be compromised, just as any bank can be robbed. We are left with a situation in which hacking that results in costly damage is punished selectively at best and, in a case like the Internet attack, almost not at all.

At least the bank president knows that the courts stand ready to provide some measure of deterrence when a convicted robber faces the bench for sentencing.

LETTERS TO THE EDITOR

The Promised LAN

As an information systems professional, I am offended by your cover article "LANscape laced with minefields" [CW, April 23] and past articles which are constantly prone to LAN-bashing.

What it all boils down to is dollars. LANs have taken a major chunk of the IS market by storm, and LANs have been a catalyst to the IS community, spurring vendors to build a better mousetrap (which is the American way). *Computerworld* continues to perpetuate the myth regarding LANs. Confusion is what we need least in the IS community. The LAN Of Opportunity is large and all-encompassing; LANs are still in their infancy, but we are not far from the Promised LAN. Lighten up on LANs.

Timothy A. Rollins
President
The Rollins Group
Los Angeles

Mythconceptions

I believe your article "Myth of the elite programmer" [CW, April 9] comes to certain inaccurate conclusions.

National information systems recruiting professionals have found that few people are hired because they know C or Cobol in a particular technology environment; instead, clients ask us to locate people who know Unix and C or MVS and Cobol and have used those skills to support a specific application or product development. Once you take this more realistic measure into account, we discover that few mainframe programmer/analysts earn more than $55,000, while there are certainly many working with C who earn in excess of that amount.

C programmers are also more highly paid for less chronological experience than are those with mainframe experience.

What is true is that firms want to hire specialists who have experience with their type of technology environment and their type of business or product environment. They will continue to do so throughout the 1990s, as a way of coping with the extreme labor shortages American industry is facing.

Jeff Altman
President
Jeff Altman & Co.
New York

Coverage costs

In a recent article on viruses, "Health insurance for computers" [CW, April 23], I was quoted as stating that the current available limit of virus-specific insurance is "about $100,000." This figure is applicable to only one of the handful of insurance carriers offering policies that include damage from viruses as a covered peril. Theoretically, it is possible to obtain a minimum of four or five times that amount in limits. In practice, obtaining an adequate level of coverage depends on the level of understanding and communication among the entity applying for coverage, the entity's insurance broker and the underwriter.

John C. Lamberson
San Jose, Calif.

Paper view

In "EFT: If money could talk . . ." [CW, March 26], Bill Brandel said: "A company can send it by paper, a third-party network, the ACH . . ." No way! The whole point of electronic data interchange is not to send it by paper. That obviates the crux and theme of EDI.

Perhaps to clarify this point, it would do well to give a definition of EDI. Usually, such definitions suggest that EDI is "electronic exchange of computer-processable data in standard form." Thus, paper, faxes and electronic mail do not qualify as EDI, as they are neither machine-processable nor in standard format, and paper is not electronic.

The article also suggested that the automated clearinghouse (ACH) network was originally structured for banks to exchange funds among themselves. It has been my understanding that the purpose of the ACH was to establish an electronic counterpart to the existing check settlement system. The ACH sorts checks by exchange of electronic records, not sorted paper stacks.

Regarding the Corporate Trade Exchange (CTX) format of ACH, it is my understanding that the addendum record has been expanded to include and contains the EDI X12 remittance/payment advice protocol. The CTX addenda has more than 9,900 character records. That's a pretty large addenda to a payee that you are advising about taking a discount or paying partially.

Louis Hochstaedter
President
High City International, Inc.
Novato, Calif.

Project development subtleties

WILLIAM DUNCAN

There seems to be a malicious rumor spreading through software development circles that project management and project methodology are one and the same.

Why is it important to recognize the distinction between the two disciplines? Because the failure to recognize and accommodate the difference remains a leading cause of project failure.

A project methodology, or more accurately, a systems development methodology, defines the strategies that the organization will follow when developing software. For many, the choice of a methodology is akin to the choice of a religion — there is only one true way.

Some preach the gospel of highly detailed methodologies. They distribute thick volumes of forms to document everything from a user interview to a technical walk-through. Some decry the depersonalization of formal structures and worship prototyping or rely upon divine guidance from a techno-guru or two.

Project management seldom inspires such passions. It is,

Duncan is president of Duncan Associates, a project management consulting firm based in Lexington, Mass.

quite simply, the process of converting the strategies defined by the methodology into an operational plan to guide the conduct of day-to-day project activities.

For example, in most methodologies, "identify and interview key users" is a critical success factor. If your methodology calls for such interviews, project management tools and techniques will help you implement that strategy by answering the following questions:
• Who is responsible for developing and approving the list of key users?
• Are there enough analysts available to do the interviews?
• If the interviews take longer than originally planned, what implications does that hold for cost and schedule performance?

Admittedly, there is some overlap between the two. Many methodologies provide some guidance on the most obvious project management issues. Delivering a system that conforms to the specifications is a key objective of both project management and most methodologies.

Given the overlaps, why not just merge the two disciplines into one? Let me illustrate why not with two case histories.

In the first instance, I recently heard a presentation by a senior manager at one of the best known information technology consulting firms. He noted that many companies were losing

substantial chunks of market share to more nimble competitors because of their inability to develop mission-critical systems in a timely fashion.

Part of the problem, he said,

Bob Dahm

was that we needed a "whole new approach to project management." But the problems he described were those of highly structured traditional *methodologies* that equate the quantity of forms with the quality of the system and that mandate slavish

adherence to detailed plans — even when the plans clearly are no longer appropriate.

If he had made a clear distinction between project methodology and project management, he could have used the strengths of the latter to counter the weaknesses of the former. Good project management can make even

the most rigid methodology more flexible by helping to identify appropriate trade-offs between cost, schedule and technical performance.

In the second case, I saw an article about "prototyping as a project management tech-

nique." I had to read it twice, however, before I understood that the author's definition of a project management technique was "anything that will get the job done quicker."

However, prototyping has nothing to do with project management. Whether you prototype or use a more traditional methodology, you still need project management to help estimate and schedule the time of the people creating the software. Regardless of the methodology, good project management will help get the project done on time by improving resource allocation decisions and by anticipating and avoiding problems that could cause delays.

In both cases, by confusing project management with project methodology, experienced software developers cut themselves off from a body of knowledge that can help them respond to the demands of today's information technology environment.

By failing to use all the tools at our disposal, we court disaster. Every software professional has a favorite horror story about a system that was months or even years late — or one that was so full of bugs it was virtually unusable. How many of these problems were caused by weak methodologies? How many by poor project management?

Are you willing to risk failure on a mission-critical software product? If not, it might pay to examine your project methodology and your project management independently.

Justice failed in refusing to make Morris an example

MICHAEL ALEXANDER

Suppose Robert T. Morris had stolen a bicycle and rode across the country, periodically stopping to try the doorknobs of houses at random. Whenever he found an unlocked door, he would wheel the bike into the house and ride around while the homeowners slept. Suppose later he said that he meant no harm even though thousands of homeowners woke up the next morning to find their front and back doors ajar and muddy tire tracks across their floors and carpets.

Would Morris have gone to jail? You bet.

That is basically what Morris did the evening of Nov. 2, 1988. But Morris isn't going to spend one night in jail, even though jail time is what he deserves. As he admitted on the witness stand

Alexander is *Computerworld's* senior editor, advanced technology.

during his trial in January, Morris created a worm program and intended to deposit a copy of it in as many computers as possible on Internet. A programming error caused the program to replicate out of control, he said.

He didn't mean any harm, one of his lawyers told the judge. This boy is basically honest and did not act out of malice, the other lawyer said. His act was reckless, irresponsible and stupid, but he should not be incarcerated, they pleaded only minutes before sentencing last week.

The U.S. Justice Department, which had been divided on how to prosecute this case from the day it happened, backed off at the last minute and opted not to recommend sentencing, as it usually does. Federal prosecutors told the judge that although the government was unable to recommend an appropriate sentence, "some period of incarceration would be warranted."

The judge, an admitted technophobe, apparently bought into the notion that Morris was merely a modern-day sorcerer's

apprentice who played with the boss' magic wand without permission.

Immediately before sentencing, the judge said that he had no legal precedent to follow and that the penalties for traditional crimes such as trespassing just did not fit this case. Then he sentenced the ex-Cornell University graduate student to a three-year probation, fined him $10,000 and ordered him to do 400 hours of community service.

Later, outside the courtroom, the defense lawyers said they hope Morris will spend his 400 hours of community service applying his computer talents. To me that seems like allowing an arsonist to install smoke detectors.

Lost opportunity

Compared with rape, murder and major-league drug dealing, this crime is small potatoes. It is easy to understand why a judge might be reluctant to put Morris in jail. Even so, the courts missed their biggest opportunity thus far to send a message to "wannabe" outlaw hackers.

Morris' lawyers argued that it would not have been fair to make an example or symbol out of him. I maintain that you have to draw the line on computer crime

somewhere, and "somewhere" was in a federal district court in Syracuse, N.Y., last week.

No sentence, no matter how severe, will deter outlaw hackers, but there are plenty of youngsters who may be headed in the wrong direction that could conceivably have been induced to stay on the straight and narrow by making an example of Morris.

Take the case of the 12-year-old boy in Michigan who was arrested a couple of weeks ago for breaking into a TRW computer and stealing credit-card numbers, which he gave to fellow cyberpunks to charge merchandise illegally. Kids like that apparently have no idea that hacking into computers is wrong, mainly because they see others get away with it every day.

While it is too late to keep that particular kid out of trouble, a sharper response by the courts would have sent a stern warning to other potential outlaw hackers while they are still impressionable and able to learn a lesson or two.

Hackers all over the country are getting off with a slap on the wrist or less. The rest of us, like those hypothetical homeowners, are left to clean up the mess.

You should believe that the

problem of computer fraud and abuse will get worse in the years ahead. Already, computer viruses are proliferating astronomically, and while there are no reliable figures available, the losses must certainly amount to millions of dollars per year.

It is going to take a whole new attitude about computer crime if we are to have even the remotest prospect of coping with it. We are also in desperate need of new remedies to combat computer crime, and those remedies should include jail time in many instances. A clear-sighted superior court judge in Arizona, for example, recently sentenced a hacker who had stolen telephone access codes to 20 days in jail in 10 two-day blocks so as not to interfere with his employment. The hacker was also fined $5,000 and prohibited from using computers except as required under supervised legitimate employment for the duration of his three-year probation.

Morris should have gotten a sentence with similar provisions.

Instead, the judge and, to some extent, the Justice Department failed to lay a cornerstone in a foundation on which the country can build a workable set of laws aimed at combating computer crime.

URGENT MESSAGE

TO _New Subscribers_

FROM _Computerworld_

DATE _Today_ TIME _9:00 A.M._

Important	✓	Return Card	✓
Subscribe Today!	✓	Telephoned	
Answer Questions	✓	Save 57% Off Cover	✓

MESSAGE _Save money. Get 51 issues of Computerworld for only $44.00*!_

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Please answer questions to qualify for this rate.

1. BUSINESS/INDUSTRY (Circle one)

10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
75. User Other _____
95. Vendor Other _____
(Please specify)

23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs., Supv. of Programming, Software Dev.
32. Programmers, Software Developers
50. Sys. Integrators/VARs/Consulting Mgt.

OTHER COMPANY MANAGEMENT

11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management

OTHER PROFESSIONALS

70. Medical, Legal, Accounting Mgt.
50. Educator, Journalists, Librarians, Students
90. Others _____
(Please specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT

19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm Network Sys. Mgt., Dir./Mgr. PC Resources

3. COMPUTER INVOLVEMENT (Circle all that apply)

Types of equipment with which you are personally involved either as a user, vendor, or consultant.

A. Mainframes/Superminis
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Local Area Networks
F. No Computer Involvement

E2020-9

Basic rate: $48 per year. *U.S. Only   Address Shown: ☐ Home   ☐ Business

SYSTEMS & SOFTWARE

SOFT TALK

Jean S. Bozman

Quality, not quantity

For Oracle, high-speed growth is out; quality is in. That is the new message from both Chief Executive Officer Larry Ellison and Peter Tierney, senior vice-president of Oracle's Product Division. "We are shifting our priorities toward account management, customer satisfaction and quality," Tierney said of the firm, which has made it a priority to double in size each of the last 10 years.

The fact that Oracle has finally decided to keep its existing customers happy — and to invest time and money to that end — surely comes as a relief to frustrated users, who have been complaining that Oracle support was spotty and insufficient.

Oracle's largest customers are among those most dissatisfied with the firm's affinity toward fast-paced sales of high-ticket items — and its sometimes quirky follow-up. "We find we're dealing with an increasingly sophisticated customer who is willing to make commitments to buy products across his corporation," Tierney said. "But he's saying, 'Your quality has to improve.' "

IBM, DEC applaud CA '90s

Public endorsement of new architecture lends credibility, comforts users

BY AMY CORTESE
CW STAFF

Executives from IBM and Digital Equipment Corp. shared the stage with Computer Associates International, Inc. Chairman Charles Wang moments after Wang publicly endorsed IBM's and DEC's software frameworks at the recent CA '90s announcement. It was a rare joint appearance by high-level executives from the hardware companies.

"This is an historic occasion as the industry works together," said Robert Berland, IBM's director of application solutions.

Berland said IBM had been working with CA for two years to facilitate software solutions based on its Systems Application Architecture (SAA), adding that "SAA will be the underpinning to the structure CA and others deliver."

Henry Ancona, vice-president of business and office information systems at DEC, applauded CA for offering users freedom of choice and stressed DEC's strategic development relationship with the Garden City, N.Y., firm.

However, analysts have since downplayed the significance of the IBM and DEC executives' presence at the CA announcement, interpreting it as a show of support for their own respective architectures.

Fighting optimism

"The significance of the two being there was the fact that there was an endorsement of the SAA and [Network Application Support] architectures," maintained Sam Albert, president of the Sam Albert & Associates consulting firm.

However, the credibility lent by the two heavyweights' presence "made most customers feel better," said James Kinder, director of database administration at Automated Data Processing, Inc.

Users have welcomed the CA initiative so far. Murray Informations Systems, a data processing center for Murray Federal Savings and Mortgage in Dallas, uses nearly 50 CA products. Wayne Sadin, vice-president of MIS, said that in the past, CA had been like a "multiheaded hydra, with too many different ways into their products."

However, over the past few years, Sadin said, the company has been moving steadily to fewer interfaces and fewer differentiations between products. He pointed to CA's Activator product, which provides a single point for start-up and installation.

Systems splurge a key in Revco reorganization

BY J. A. SAVAGE
CW STAFF

TWINSBURG, Ohio — The officers of Revco D.S., Inc. are betting that one way to bring the company out of a Chapter 11 reorganization and into profitability is to spend big bucks on new computer systems.

Revco, a 1,800-outlet chain of drugstores in 27 states, went into Chapter 11 in July 1988, two years after a management-led leveraged buyout.

To pull itself out of the reorganization, the company decided to flood resources into computer systems — primarily one to provide a database for its pharmacists, called Prescription Access Link (PAL).

Revco had to get the bankruptcy court's permission to install PAL. "PAL is one of the improvements we are making to ensure that Revco can emerge from Chapter 11 stronger than ever," Revco Chairman Boake Sells said in a statement. Revco has no specific time frame for coming out of Chapter 11, according to a spokeswoman, but its current plan expires July 31.

Revco chose Tandem Computers, Inc.'s new Cyclone mainframe, an on-line transaction processing, fault-tolerant computer. The company was one of the first production users of Tandem's Nonstop SQL database on a Cyclone, according to Mike Adamson, director of application development at Revco.

While Revco refused to say how much the PAL project cost, the eight-processor Cyclone that the pharmacy chain bought is listed at a price of $5.25 million.

Sells *looks to PAL for recovery from Chapter 11*

Adamson said the system is paying for itself because it efficiently bills insurance companies for prescriptions. "It's 10 times better than the old system," he said.

The old system consisted of NEC Corp. Astra minicomputers in each pharmacy to keep localized patient prescription and billing information.

"The pharmacists were chained to the minicomputer. It took one minute in between screens," Adamson said. He added that the pharmacists were also doing their own system backups and would load rules into the database.

"Besides taking up time, they were lousy at it," he said.

PAL not only frees up the pharmacists and bills insurance companies more efficiently, its database checks for drug inter-

It runs faster.
It runs stronger.
It runs sharper.

VAXstation 3100 SPX

We'd like to introduce the newest member of our VAXstation™ family: the VAXstation 3100 SPX workstation. It's just the latest example of Digital's continuing commitment to our VAX™ workstation line.

The VAXstation 3100 SPX has the best looks in the family. And it owes those looks to the new SPX graphics accelerator. Graphic performance is up to 10 times greater than current VAXstation 3100 models. And our new high-resolution monitor based

HOW OTHERS SEE THE MACINTOSH-TO-MAINFRAME CONNECTION.

HOW AVATAR SEES IT.

When it comes to system integration, you don't have to treat the Mac differently than any other device on your network. Introducing the MacMainFrame Series, the broadest range of Macintosh-to-mainframe connectivity options available.

MORE CHOICES. MORE SOLUTIONS.

Now, in an integrated set of solutions, local or remote Mac users in Token Ring, SDLC or coax environments can tap centralized information to make every Mac user's desktop more powerful.

MacMainFrame distributes terminal emulation, file transfer, printer emulation and mainframe

graphics across a wide variety of networking schemes.

Since it's fully AppleTalk compatible, EtherTalk, Token-Talk and LocalTalk networks are part of the solution, too.

For customization, there's Avatar's Programmer's Toolkit, a full range of Applications Programming Interface (API) tools. For example, Avatar's Hypercard API has been used to develop a front end system to PROFS, IBM's electronic mail system.

THE MACMAINFRAME DIFFERENCE.

Unlike some Mac-to-mainframe connections, MacMainFrame enhances the benefits of the

Macintosh user experience.

Since MacMainFrame is completely IBM 3270 compatible, it has no impact on normal mainframe operations. The result? An integrated working environment that increases productivity and reduces headaches.

SOMETHING ELSE WE SEE. SERVICE.

With eight years of experience, Avatar offers something beyond products and technology. It's called responsiveness. You see, as the 3270 connectivity specialists, we have helped to integrate Macintosh computers and PC printers into many different en-

vironments. Which means we can do the same for you. With a single integrated set of solutions for Token Ring, SDLC, and coax, both standalone and via gateway.

To find out how, call this number toll free at

1-800-289-2526.

You'll find that we understand Macintosh-to-mainframe connectivity like no one else. So as your network options continue to grow, Avatar can help you see the forest through the trees.

Public TV meets up with high-tech IS

ON SITE

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — As sure as green plants grow in *The Victory Garden* and souffles rise to golden heights for *The French Chef*, WGBH has turned fund-raising into a high-tech performance.

The Boston-based station is a leading producer of public television programming, boasting one of the largest computer installations in the Public Broadcasting System (PBS) with 500 Apple Computer, Inc. Macintoshes and a Digital Equipment Corp. VAX 8550.

Yet while the Macs are used in the front-line work of word processing, writing and editing scripts, it is the behind-the-scenes VAX that serves as the engine for financial data and a massive fund-raising database of 1.5 million records.

"We track lots of information on every donor — data on the amount and type of gift, motivation for giving and whether the pledge came by phone or direct mail," said Mary Meadows, WGBH's director of information systems.

WGBH has served as the fine-tuner for a database management system from Access International, Inc. in Boston. Access created the system in a marketing partnership with Cambridge, Mass.-based Admins, Inc., using Admins' key product — the Admins/V32 fourth-generation language.

Access now markets a fund-raising system, modeled after the WGBH system, to other public TV stations, nonprofit hospitals and associations.

In 1989, WGBH raised $15.4 million in donor contributions alone, and its overall budget was heading toward the $100-million mark, necessitating an upgrade in computing power. "We've only had the VAX for a year, but we'd be in real trouble without it," Meadows said.

The upgrade to an 8550 from two older VAXs — an 11/780 and 11/785 — enabled WGBH to merge its financial and fund-raising systems on one machine. A Decserver 550 attached to the single-node Vaxcluster supports about 50 data-entry terminals.

Faithful watchers of public TV — such as the 10 million who regularly tune into *Nova* — often find fund-raising as unrelenting as the advertising on commercial TV. WGBH now runs three major campaigns per year, and the trend is turning more toward "occasional spots" after a hot show, Meadows noted.

Despite the high-tech spin WGBH puts on fund-raising,

Meadows said, "This is not a real technical place."

Those smiling pledge-takers, for example, are not hunched over terminals, typing in each

David Leifer

WGBH's Meadows *puts a high-tech spin on fundraising*

caller's donation. They write the information, passing the paperwork along to a service bureau for data entry.

However, WGBH is still considered state-of-the-art in public TV fund-raising, with only WNET in New York and PBS headquarters in Washington, D.C., as technological rivals, Meadows pointed out.

Only a dozen or so of the 319 PBS stations nationwide are large enough to even have an IS department, she explained.

"We have three needs," Meadows said. "Our financial system needs to be good, our fund-raising needs to be good,

and end-user support has to be there for word processing, scripting, corresponding and messaging."

The 11-member IS staff, operating on an $835,000 annual budget, is sensitive to the volatile nature of its end users. "The production people are busy and creative and not very tolerant of bureaucracy," Meadows said

with a smile. "They work crazy hours."

Her microcomputer service team, for example, tends to do less technical troubleshooting and more consulting work with employees trying to build small databases. Meadows herself has little technical background, leaving behind an art and management major in college to join WGBH 16 years ago as a fund-raising assistant.

By the time the station was ready to overhaul its administrative computing in 1985, Meadows was the only one with hands-on experience in every major user department. A task force was appointed to develop a computing standard for the station, with an eye toward IBM or DEC as the likely choice.

However, a few Macintoshes had won the hearts of the design department, prompting the task force to consider them instead of IBM Personal Computers. "Now we're four years and 500 Macs later," she said.

There is currently little or no interaction between the Macs and the VAX, but by next September, planned modifications to Access' Financial Management and Control System will enable use of the Macs as dumb terminals on the VAX.

"We'll be able to view financial information and also have the ability to download certain sets of financial information," Meadows said.

Customers consider Cincom to be an oldie but a goodie

BY ROSEMARY HAMILTON
CW STAFF

Cincom Systems, Inc. may not be a high-profile giant like its two chief mainframe database rivals, but apparently not all customers believe bigger is better.

"They've been around for many years," said Richard Krejsa, manager of systems programming at Boston Industrial Products, a division of Dana Corp. "With the core products

they have now, I don't feel insecure staying with them at all. I have no problem sleeping at night."

Like Krejsa, several Cincom customers interviewed recently have a long history with the company. They said Cincom has not let them down, and they expect this trend to continue. Furthermore, they support the firm's plans to bring its Supra database management system to other hardware platforms, including

personal computers and Unix systems, as well as to deliver a distributed database capability.

Customers also acknowledged that being outside the IBM and Computer Associates International, Inc. camps has its drawbacks. For one thing, Cincom customers do not have a wealth of third-party tools and companion products available for their database environment, as IBM or CA customers do. However, Cincom users said the core database product is strong enough technically that they are willing to make this trade-off.

"Outside of the fact that there aren't people developing tools to go with the database

product, that's the only place I see it coming up short," said Warren Crawford, manager of database services at Mastercard International, Inc.

Crawford said he is particularly interested in Cincom's distributed database strategy, since Mastercard is looking at replacements for the IBM Series/1 it uses at remote locations. Although an evaluation process has not officially begun, the firm will look to Unix-based systems, he said. If Mastercard goes with a Unix system, it could eventually load Supra at regional locations to communicate with the host Supra, he said.

Cooper Energy Services, a di-

vision of Cooper Industries, Inc., is another customer watching Cincom's plans. Cooper plans to install several midrange computers at its plants and would like to install a Supra version at some of these sites, according to software engineer Jim Linkous. It is likely that Cooper will select an NCR Corp. Tower system, although that decision has not been finalized, Linkous said.

"Certainly, we do have some concerns, but we've dealt with Cincom since around 1970," Linkous said. "Cincom through the years seems to stay up with or ahead of the others. We have confidence that they'll stay on the state-of-the-art line."

D&B installs instant-analysis service

BY AMY CORTESE
CW STAFF

MURRAY HILL, N.J. — Dun & Bradstreet Corp.'s Credit Clearing House (CCH) has provided credit information to the apparel industry for more than a century — testimony that timely information is never out of style. Now, D&B has fashioned an expert system to analyze credit.

Part of D&B's Business Credit Services, CCH serves some 60,000 manufacturers, wholesalers and distributors by tracking information on roughly 200,000 retailers, from large chains to small mom-and-pop shops. By phone or by dialing directly from their personal computers, D&B clients have access to information that can help them determine a retailer's overall business condition.

Like other D&B Credit Services, the apparel industry service has evolved over the years from simply supplying credit information to providing more analysis, even determining a dollar-specific credit recommendation. "We are providing a decision, not a report," said Joseph Pilla, director of product marketing for Credit Services. However, maintaining and analyzing data has proved labor-intensive and time-consuming.

D&B has turned to expert system technology to deliver more up-to-date information. The system, based on Inference Corp.'s ART-IM expert system shell, accesses information contained in a CCH database to produce a credit recommendation within seconds. In production since last July, the CCH system marks D&B's first expert system application.

The system has been rated a success, according to Pilla. The number of credit analysts has dropped from 12 to eight, while the number of companies the CCH is able to cover has increased by 60,000. A request for information used to take up to three days to fulfill. Now the expert system can come up with a recommendation in a matter of seconds. More importantly, Pilla said, the system "gives customers the benefit of the most experienced analyst and a uniform level of consistency."

Comprehensive database

The CCH recommendation database is a subset of D&B's corporate reports database, a comprehensive database containing more than 10 million files. In the past, a staff of credit analysts using this information determined dollar-specific credit limits and overall credit ratings for the retailers tracked. When new information became available on an apparel-related company, the analysts would review the information, update the report if necessary and send the updates to a data-entry department for input. Consequently, reports might not reflect the new information for a few days.

Because of production constraints, not all businesses that were of interest to customers could be tracked. While a business report might have been available on a retailer, in many cases a credit recommendation had not been fabricated. That could lead to lost business revenue, according to a D&B study that found that 30% of customers would abandon the service if a recommendation were not immediately available.

Staffing also posed a problem. It took up to nine months for an analyst to be trained, but the repetitive tasks required of the entry-level analyst resulted in high turnover rates. Then, in addition to training and hiring costs, valuable expertise was lost.

D&B began looking into expert systems in 1987 and engaged the consulting services of Coopers & Lybrand to help build a prototype knowledge model. A video camera recorded the decision-making process of a senior credit analyst working with a novice analyst with documentation.

The model was shown to roughly 40 customers as a "reality check." "You have to have a grounding," explained Roger Jambor, director of applied research for D&B's Information Systems Management group. "You cannot become enamored with the technology."

D&B then began to look for an expert system shell to implement the model. Since the production platform had not been determined, D&B wanted a transportable shell. "We wanted something we could develop on a PC and deliver on a [Digital Equipment Corp. minicomputer] or a mainframe," Jambor said.

After the CCH application was developed, on a PC, it was moved onto two DEC Microvaxes. DEC equipment was new to D&B, primarily an IBM shop, but the Microvax was selected because it could provide a smooth growth path if the system resource requirements increased.

CCH is linked to an IBM 3090 mainframe containing a Computer Associates International, Inc. IDMS database of CCH records. The system extracts and reviews financial, historical and background information on a company and uses any number of the 800 rules in the expert system knowledgebase to come to a decision. Customers may rely on this decision or simply use it as a guide in reaching their own conclusions.

Currently, the expert system handles from 80% to 85% of CCH recommendations, the remainder being flagged for analysts to review. That amount is expected to be reduced to 6% to 7%.

D&B's Jambor *emphasized system transportability*

Systems tools dominate Dexpo

BY MAURA J. HARRINGTON
CW STAFF

NEW ORLEANS — Systems management products were among the key offerings at the Dexpo South show last week, which coincided here with the Digital Equipment Corp. Decus User Group Conference, a few blocks down the road.

Raxco Software, located in Rockville, Md., unveiled Raxmanager Version 3.0, a system software product designed for VAX/VMS products, said Robert Nolan, vice-president of products development.

"Raxmanager Release 3.0 will embed graphics capabilities into the product for the first time," Nolan said, adding that the new version features a smoother interface and performance analysis, disk management and capacity planning features.

The product will be available in July at prices ranging from $3,000 to $16,000, depending on configuration, Nolan said.

Raxco also displayed three existing software products it recently acquired from Edison Software, Inc. The tape management products, which have been renamed, include Tapecontrol, Tapeconvert and Tapeimage, though pricing for the new line has not yet been determined, Nolan said.

Irv Shapiro & Associates, a consulting and training firm focused on products for DEC VAX users, announced its new software division, IRA Solutions, which will include software products and automated systems hardware/software packages, President Irv Shapiro said.

The products, designed for "lights-out operations" of DEC's VAX systems, were on display featuring minor upgrades, the company said. The products include: ISA/Taskmaster, ISA/Sysmaster, ISA/Responsemaster and ISA/Netmaster.

On the applications side, Lubbock, Texas-based Compu-Share has incorporated scanned imaging and graphics capabilities into its Human Resources Management package, according to Neil Baldridge, vice-president of engineering for Compu-Share.

The Human Resources Management & Imaging System allows the user to scan photographs, documents and signatures, for example, into the computer along with other text information, Baldridge said.

The advantage of having original information integrated into the on-line human resources package, Baldridge said, is that it can be either transferred via electronic mail or printed on paper.

"It will allow access to original documents where the look and feel of the document is important," Baldridge said.

Compu-Share's Human Resources & Imaging System is priced from $7,500 to $50,000 and is designed to be used with Decwindows. The product is slated to begin shipping this fall.

A DEC challenger with drive

System Industries, once again playing David to Digital Equipment Corp.'s Goliath, has introduced an 8-in. disk drive that provides 1.7G bytes of formatted storage for DEC VAX machines.

Claiming its new storage subsystem is a better and cheaper alternative to DEC's recently announced 1.5G-byte RA92 drive, System Industries said its drive has a 13-msec average seek time and a data transfer rate of 2.75M byte/sec. DEC's RA90 and RA92 drives have average seek times of 18.5 and 16 msec, respectively, while their data transfer rate is also 2.75M byte/sec.

The SI817 C-Series drive is the firm's first 8-in. subsystem to incorporate embedded drive interface circuitry, which allows more drives to be placed in a cabinet. "This is a relatively new, evolutionary extension of existing drives," said James Porter, president of Disk/Trend in Mountain View, Calif. "SI has normally made use of the newest drives once they're in production on a stable basis."

System Industries uses drives manufactured by Seagate Technology in Scotts Valley, Calif. The drives can connect directly to the hierarchical storage controllers used on DEC Vax-clusters, as well as to DEC KDB50, QDA50 and UDA50 controllers.

The System Industries drives can be mixed with drives of smaller capacities and solid-state disks in tiered storage configurations. Available now for evaluation, the drives are slated to ship in volume by next month, starting at $25,875 for an entry-level system.

CA '90s

The CA '90s announcement reassured Sadin that CA's top management was committed to a unification strategy. "I always knew CA had the money to do whatever they wanted. Now I see they have the vision to define an architecture and the commitment to carry it out," he said. The announcement was "more promise than delivery," he said, but "what I am happy about is the commitment."

"Whenever you have a company as large as CA, anything they do to standardize is good. They have already done a lot of that over the last few years — they just didn't call it an architecture," Sadin said.

Some, however, are awaiting more details from CA. Kinder said he is pleased with the direction CA has set but would like more tactical information, for instance, on their database strategy.

With the CA '90s architecture, CA claims it will bridge its various database management products with standard interfaces and access methods. Similarly, it will provide a common interface across all areas of its product line to present a more uniform face to users. Most observers agree this approach is a smart one for CA, but they say it will not be easy.

"It will be a challenge to implement and carry out everything they said they would," said Dale Kutnick, president of market research firm Meta Group, Inc. The sales force "will have to go from being bag-carrying catalog salespeople to architecture salespeople," he said. Ultimately, he said, the architecture "will make customers' lives simpler and enable them to do more with their CA products."

Will IBM sites find RS/6000 compelling enough to switch?

TEMPE, Ariz. — Some of the largest IBM sites in the country are showing significant interest in IBM's Unix-based RISC System/6000 workstations, and several would consider a switch from other workstation vendors such as Sun Microsystems, Inc., Hewlett-Packard Co.'s Apollo Division and Digital Equipment Corp.

That was the finding of a survey recently released by The Sierra Group and First Boston MIS Executive Council, which polls 50 of its 150 council members each month on computer industry topics.

In a telephone survey conducted in March, 50 information systems directors and corporate vice-presidents were asked their impression of the strengths and weaknesses of the reduced instruction set computing (RISC) workstations. "On a scale of 1 to 10, they gave it an 8 on average," said Merrily Shinyeda, president of The Sierra Group, Inc.

Among the sites surveyed, 29 use workstations as part of their hardware platforms and 11 of those firms said they would consider switching vendors. "That may not sound like a lot," Shinyeda conceded, "but the volume these companies represent could be sizable. These are all highly visible industries, and that makes the numbers more significant."

While IBM may be targeting the RS/6000 at scientific and technical markets, Shinyeda said the survey showed a burgeoning interest in commercial accounts at insurance companies, financial and securities institutions and banks. "That says to us that the broader issue of workstations in the commercial marketplace is really picking up," she added.

The Sierra Group and First Boston did not identify the companies responding to the monthly survey, but Shinyeda said most were Fortune 500 firms.

The executives surveyed found the power and price/performance of the RS/6000 compelling enough to outweigh their concerns about a lack of commercial software, Shinyeda noted.

Some of the respondents questioned IBM's experience in the workstation market and worried about the missing support for the RISC workstations under IBM's Systems Application Architecture. "Some of them also cited problems they had with AIX Version 3," Shinyeda said, referring to IBM's version of AT&T's Unix System V operating system.

The Sierra Group researchers found that about one-third of the survey respondents were increasing their company spending on workstations, and about half were spending more on file servers.

HARD BITS
Unisys extends Surety program

Unisys Corp. has extended its Surety Service Program to its A Series, 2200/1100 Series and System 80 mainframe lines, giving users of its large systems new options in maintenance support. The Surety program for the U Series line of Unix-based minicomputers was previously expanded to include Unisys' PC/PW2 line of personal computers.

NCR Corp. and Software Earnings, Inc. in Memphis, Tenn., have joined forces in a marketing agreement to provide check processing systems for the banking industry. NCR officials estimate the worth of the alliance at $20 million over the next several years. Software Earnings will develop personal computer-based check processing software for the NCR 7770 Multi Pocket Proof machines and productivity tracking software for the

NCR 7766 Clustered Proof machine.

Digital Equipment Corp. has announced two new parts replacement programs to help customers who maintain their own DEC equipment. Decmailer Plus features 24-hour turnaround time for purchase orders, 90-day warranties and return freight paid by DEC. Factory Express for non-DEC components offers discounts on more than 1,800 parts.

Scientists from Thinking Machines Corp. and the Mobil Research and Development Corp.'s Dallas Research lab recently won the IEEE Gordon Bell Prize for parallel computing performance. The winning application is used by Mobil in advanced seismic processing and runs on the Connection Machine supercomputer from Thinking Machines.

How to keep from being locked in

without being locked out.

**Announcing new FOUNDATION®
applications development tools
that keep your options open.**

In the nineties, MIS will have
to contend with a bewildering
array of multiples. Multiple en-
vironments. Multiple platforms.
Multiple methodologies. Multiple
standards. Multiple vendors.

Multiple headaches.

To ease the way, Andersen
Consulting has just announced
a major expansion of its FOUN-
DATION suite of full-lifecycle
CASE tools—tools that provide
MIS with unprecedented flexi-
bility to deliver real world solu-
tions across platforms, vendors,
and environments.

FOUNDATION will help you

keep your options open, letting
you make the best choices for
each environment in the enter-
prise, free of the constraints of
conflicting cultures and proprie-
tary systems.

With FOUNDATION, you
won't be locked in to a single
vendor, a single standard, or a
single methodology, just for the
sake of compatibility.

Similarly, you won't be lock-
ed out of future advances. If
changing business conditions
dictate new system solutions,
FOUNDATION enables a smooth
transition to new platforms and
environments.

It all adds up to compatibility
without compromise.

So if you're looking at the
decade ahead and wondering
how you're going to develop the
kinds of strategic applications
that the times will demand—
the ones that are responsive to
global conditions, that create
real differentiation, that deliver
the right information at the
right place at the right time—
then you owe it to your enter-
prise to bring FOUNDATION
into the picture.

Call us at 1-(800) 458-8851
or 1-(312) 507-5161.

ANDERSEN
CONSULTING
ARTHUR ANDERSEN & CO., S.C.

Where we go from here.™

Sharebase buyout appears set for warm user reception

BY JEAN S. BOZMAN
CW STAFF

SUNNYVALE, Calif. — Sharebase Corp. users who met here recently seemed relieved that their database machine vendor is about to be acquired by $1.3 billion Teradata Corp. in Los Angeles.

The two firms are in allied businesses, building dedicated processors to run relational database software. The merger, which is scheduled to be finalized in June, follows several years of poor financial results for $29 million Sharebase (formerly Britton-Lee, Inc.).

"I don't think many users dropped by the wayside over the last few years," said Bob Thompson, president of the Sharebase user group and information systems manager at Reynolds Electrical and Engineering Co. in Las Vegas. "The

general feeling was that if they didn't get the money they needed to promote their products, they were going to go out of business. The products, though, were so technically unique that

we always felt some company would buy the right to market them," Thompson said.

Users pleased

The 100 users who attended the meeting said they were also pleased with a new release of the Sharebase operating system called Sharebase III that runs on the high-end Server 8000 line. Older Sharebase systems, such

as the Server 500 and Server 700 products, cannot run Sharebase III, company spokesman Scott Humphrey said.

"We needed the date-time stamp and the referential integrity features in Sharebase III," said a U.S. Department of Defense user who did not wish to be identified. "Now that they're supporting the ANSI SQL standard, I can assure my manage-

ment that the Sharebase machine will be compatible with a great number of dissimilar hardware systems."

The new software release supports the ANSI 89 standard for data exchange using SQL.

Just two weeks ago, Sharebase III was certified ANSI 89-compliant by the National Institute of Standards and Technology, according to Humphrey.

Revco
FROM PAGE 25

actions and complications, "not just at the item level but at the ingredient level," Adamson said. He said that when there are 612 varieties of a drug such as Darvon, the flags generated by the database are critical. "If an ATM transaction goes wrong, you might have lost $50. If this is wrong, we may have just killed our customer."

> # "IF THIS IS wrong, we may have just killed our customer."
>
> MIKE ADAMSON
> REVCO

Keeping the rules for insurance billing is almost as critical to Revco's financial health. "There are over 500 carriers, each with different rules [for payment]," Adamson said.

When the stand-alone minicomputers are removed from the pharmacists' offices, they are replaced by "generic brand" personal computers based on Intel Corp.'s 80286 processor. These are attached to the Cyclone via a private wide-area network.

More than 300 stores are online, and new ones are being added at a rate of 30 per week, according to Adamson. The network allows for "thousands of I/Os" for every transaction, and the user gets the screen back in under five seconds, he said.

Bozman

CONTINUED FROM PAGE 25

The new quality imperative means more on-site support, more highly trained support personnel — and more hand-holding.

"When you get to be a big company like IBM, you have to start to act like IBM does, and that includes providing better account support," said Tierney, himself a former IBMer. However, he gave no details of how the new quality imperative will be funded or staffed.

The reason for the change in attitude on financial growth is simple: Oracle is lowering its sights and adjusting to the realities of a product-saturated market-place. Sales of large computer systems have slowed in North America and, with them, the prospect of selling brand-new Oracle systems to brand-new customers. Recent financial setbacks on Wall Street — Oracle stock lost one-third of its value after a bad earnings report in March — have been like a splash of cold water on the face, jolting Oracle into damage-control action.

Sales orders had been flying so fast at Oracle in recent years that routine maintenance and hand-holding were sometimes overlooked, according to users. They complained that junior support personnel answer the phones and are often unable to resolve difficult problems. Even Tierney conceded, "We recognize that we've got to be more reponsive when there are problems with our products."

An Oracle database manager at one large Fortune 500 firm underscored the need for greater attention to detail at Oracle. The industrial firm, which has spent hundreds of thousands of dollars at Oracle over the years, was among those that set an ultimatum for better support: Provide it or the Oracle bill will go unpaid. Industry analysts said the user backlash has been intense enough to push Oracle's receivables to 140 days or more — significantly above the industry-standard 90 days.

Strong user resistance prompted meetings with senior Oracle executives in recent months — and angry exchanges of letters between Oracle's California headquarters and regional user groups. Next month, in an attempt to smooth things over with regional user groups, Ellison, Tierney and other Oracle executives will host the presidents of 10 key user groups at the firm's new headquarters.

"We see this meeting as a kind of open forum on how Oracle conducts business with its existing users," said David Kreines, president of the International Oracle Users' Group, which organizes the annual Oracle user meetings. "Just the fact that they're finally admitting there are problems is encouraging," he added.

Bozman is Computerworld's *senior West Coast editor.*

PSDI unveils graphics pack

BY MAURA J. HARRINGTON
CW STAFF

CAMBRIDGE, Mass. — Project Software & Development, Inc. recently added graphical user interface capabilities to its Qwiknet Professional project management software when it unveiled Version 2.0 of the package.

Scheduled to ship June 1, Version 2.0 has incorporated interface capabilities that allow the user to draw a project management structure on-screen to get a picture of the project as well as having the facts input under tables that pop up in different windows, said Chip Drapeau, PSDI's director of product marketing. The announcement of the host-based system came at about the same time that Microsoft Corp. introduced a Windows-based project management package for personal computers (see story page 39).

PSDI sought to make it easier to manipulate screens by redesigning the windowing structure in its product so that a user can access a given chart or feature from more than one location.

Other features include the following: "next step" sign posts to help novice users get around in the product; Planning Dates, which is designed to accommodate activities that must occur regardless of other events; analyses of "what-if" scenarios that are designed to assess how certain factors will affect a project; Resource Management, which automatically calculates activity durations based on the allocated resources and allows for flexible scheduling of activities when user-specified minimum requirements are met; and more, the company said.

Qwiknet Professional Version 2.0 is designed for novices, said Dean Goodermote, vice-president of sales and marketing, because the job of project management is shifting toward the less technical, more business-oriented managers. "This version is a major enhancement of our product, designed to meet the needs of the managers who do not consider themselves project managers per se," he said.

Release 2.0 runs on IBM and compatible PC-based local-area networks, IBM mainframes and Digital Equipment Corp. VAXs and Vaxstations, with an interface option to Oracle Systems Corp. databases, the firm said. Prices range from $2,500 for a stand-alone copy to $18,900 per four concurrent users on a VAX.

CONQUER THE

Corporate Sales Offices	Domestic Affiliates		International Affiliates		
Houston, TX (713) 894-4500	Boston, MA (617) 451-0900	Milwaukee, WI (Brookfield) (414) 797-8859	North Sydney, Australia 61 2 9573755	Paris, France 33 (1) 49.59.63.63	Geneva, Switzerland 41.22.48.50.00
Los Angeles, CA (La Mirada) (213) 926-5544	Chicago, IL (Schaumburg) (708) 303-0445	Minneapolis, MN (612) 335-3660	Vienna, Austria 43:222/53 36 899	Tel Aviv, Israel 972 3 5622833	Zurich, Switzerland 41.41.66.58.00
New York, NY (212) 564-7300	Cleveland, OH (Mayfield Village) (216) 646-1529	Portland, OR (Wilsonville) (503) 682-4532	Copenhagen, Denmark 45:39 27 1120	Milan, Italy (02)-21.57.851	Dusseldorf, West Germany 49/211/223028
Sacramento, CA (916) 489-1464	Detroit, MI (Southfield) (313) 354-5504	Washington, DC (Reston, VA) (703) 620-6500	Northampton, England 44 604790959	Utrecht, The Netherlands 31 3 031 3048	
Waterbury, CT (203) 756-3000	Hartford, CT (Glastonbury) (203) 633-4646		Espoo, Finland 358 0 80 39 011	Madrid, Spain 34 1 4 11 51 99	

NEW PRODUCTS — HARDWARE

Data storage

Symmetrical Technologies, Inc. has announced DDS-1300, a digital audio tape subsystem that offers 1.3G bytes of tape storage.

The system provides transparent access with interfaces to Digital Equipment Corp. VAX systems, Sun Microsystems, Inc. computers and Apple Computer, Inc. Macintoshes. It is also plug-compatible with small computer systems interface hardware and operating system software for Wang Laboratories, Inc., NCR Tower Corp., Altos Computer Systems and Hew-

lett-Packard Co. Apollo computers.

The product's price ranges from $2,500 and $4,100, depending on the hardware platform used.
Symmetrical Technologies
Suite 231
301 Gallaher View Road
Knoxville, Tenn. 37919
615-690-3838

Hitachi America Ltd. has introduced two 5¼-in. Winchester hard disk drives.

The 1.23G-byte DK516-12 has a 14-msec. average seek time and a 2.75M bit/sec. data transfer rate. It is equipped with an enhanced small device interface.

The 1.65G-byte DK516C-16 offers a 13.5-msec average seek time and a 3M-bit/sec. data transfer rate. Its small computer systems interface (SCSI) supports enhanced SCSI-2 commands.

Pricing is $3,200 for the DK516-12 and $4,300 for the DK516C-16 in OEM quantities.
Hitachi
Hitachi Plaza
2000 Sierra Point Pkwy.
Brisbane, Calif. 94005
415-589-8300

Gigatape, GmbH, the parent company of Gigatrend, Inc., has co-developed a plug-and-play 4mm digital audio tape backup product with Bull H. N. Information Systems, Inc. in West Germany.

The Giga-Dat 5¼-in. form-factor drive provides users with 1,000 passes on tape and features first backup speeds of 4M byte/min., according to the vendor. Advanced error correction coding and a read-after-write feature reportedly enable the drive to yield error rates of less than 1 in 10^{15}.

The media cost to back up 1G byte using Giga-Dat is $36. Internal versions of the product sell for $7,450.
Gigatrend
P.O. Box 4298
2234 Rutherford Road
Carlsbad, Calif. 92008
619-931-9122

I/O devices

Digital Equipment Corp. has announced the VRE01, a 19-in. flat-panel monitor for use with its workstations and windowing terminals.

The product is based on electroluminescent technology and offers 1,024- by 864-pixel screen resolution with a 60-Hz vertical refresh. The monitor weighs 18 pounds and needs only 51 sq. in. of desk space.

The VRE01 is currently priced at $11,995 and is available now, according to the vendor.
DEC
146 Main St.
Maynard, Mass. 01754
508-493-3690

A color computer monitor that provides 2,048- by 2,048-pixel resolution on a 20-by 20-in. screen has been announced by the Precision Graphics Systems Division of Sony Corp.

The Sony 20/20 was designed for imaging applications in areas such as air traffic control, medicine and science. The monitor incorporates features of Sony's Trinitron aperture grille technology, including a 0.31mm phosphor pitch and a flat-screen display that minimizes distortion and light reflection, according to the vendor.

The monitor is available in two models: the DDM-2801C, with a price of $40,000, and the DDM-2802C, for a price of $47,300. Pricing includes both a cabinet and a bezel.
Sony
9 W. 57th St.
New York, N.Y. 10019
212-418-9427

Processors

Sky Computers, Inc. has introduced a multiprocessor digital signal processor board based on the Texas Instruments, Inc. TMS320C30 microprocessor.

The Sky Challenger-C30 combines two C30 chips that can perform 32 bit/sec. data transfers. The product includes 576K bytes of random-access memory and up to 8M bytes of dynamic RAM, according to the vendor.

It offers performance of up to 66 million floating-point operations per second or 32 million instructions per second and features applications such as radar, sonar, seismic processing, speech recognition, acoustics, imaging and three-dimensional graphics.

The list price for Sky Challenger is $11,750.
Sky
27 Industrial Ave.
Chelmsford, Mass. 01824
508-250-1920

The Open RDBMS

Look W
You O

The Sybase View

Today's changing business environment demands full exploitation of multi-vendor network computing. The challenge is to integrate existing applications with new on-line systems, preserve past investments and create an open, flexible architecture for the future.

The allure of standardizing on a single RDBMS and migrating existing applications is tempting, but utopian. This "one size fits all" strategy will not preserve existing investments. And it raises the spectre of being locked into a single software vendor.

The solution: an Open RDBMS. One that provides hardware and software interoperability. One that offers a *true* open architecture and provides integration of decision support and transaction processing. One with the support of leading hardware and software manufacturers to provide heterogeneous interoperability. And one with a full range of technology integration services that can weave these heterogeneous environments into a unified computing enterprise.

OPEN ARCHITECTURE. Open architecture gives hardware and software companies — customers and competitors — access to comprehensive open interfaces. These open interfaces must be based on standards and available for extension and industry adoption. Only a network based client/server architecture, with such open interfaces, can meld an array of operating systems, networking protocols, and applications into a seamless computing enterprise.

DECISION SUPPORT. To handle real-time decision support across multiple systems, an Open RDBMS must provide interfaces that can:
■ read data from any RDBMS, non-relational DBMS, or file system
■ communicate with all dialects of SQL and with non-relational data manipulation languages.

TRANSACTION PROCESSING. To integrate production transaction processing applications, an Open RDBMS must provide interfaces that can:
■ control inter-system transactions for concurrency, consistency and recovery
■ provide access to application programs, as well as databases, to assure complete data consistency for updates
■ integrate application-specific logic for custom functionality and performance
■ transparently access such external data sources as real-time feeds, process control data, electronic document exchange, and mail services

MULTI-VENDOR INTEGRATION. An open system requires the full backing and support of industry leaders to ensure customers the benefits of direct interoperability. It creates a vendor-independent, open architecture that is more flexible than a single, vendor-centric approach.

TECHNOLOGY INTEGRATION. Making the open system work requires the assistance of a professional support organization with multi-vendor experience in DBMSs, operating systems, networks, and hardware.

Only SYBASE delivers on all of these requirements.

The SYBASE open client/server architecture is based on a commitment to standards. It provides enterprise-wide integration of decision support and transaction processing that marries SYBASE and non-SYBASE data, applications and services. Alliances with industry leaders like Apple, AT&T, DEC, DG, IBM, HP, Lotus, Microsoft, NeXT, Pyramid, Sequent, Stratus, Sun and over 100 independent software vendors ensure interoperabiity — not just portability. And Sybase's professional services division, SQL Solutions, Inc., now provides complete integration services and customer support for single or multi-vendor environments.

SYBASE. The Open RDBMS to make the open computing enterprise a reality.

THE SYBASE FORUM

This view of The Open RDBMS first appeared in
The Sybase Forum (Computerworld, March 12, 1990).

SYBASE Open Client/Server Interfaces allow data and application integration and interoperability in a multi-vendor environment.

SYBASE Open Client provides an application programming interface (API) for accessing and updating data using a variety of front end tools or applications — including SYBASE applications, independent software vendor's tools, or user-written applications. **SYBASE Open Server** provides an API for accessing and updating a variety of foreign data sources and application services. Open Server can seamlessly integrate hierarchical and relational DBMSs, third party applications and real-time data feeds into SYBASE applications.

Together, Open Client and Open Server interfaces and getaways make real-time access to various data sources and application services across networks completely transparent regardless of protocol — the essence of the on-line enterprise.

The SYBASE Open Architecture gives transparent, real-time access to various data sources, including DB2 and CICS, with transaction processing capability.

	SQL Toolset	3rd-Party Products	Client Application
		Open Client	

Client
Server

SQL Server	Open Server		DB2/CICS Gateway
	Gateways	DBMS	Server Application

INFO WORLD

FROM THE TEST CENTER
Dueling Servers

MARCH 5, 1990   THE WEEKLY FOR PERSONAL COMPUTING PROFESSIONALS   VOLUME 12 ISSUE 10

"An impressive piece of work, SQL Server delivers on its claims for high-performance transaction processing. Fast, powerful, with many innovative features that are useful yet surprisingly easy to learn and use, this multiuser database server has a promising future."

SQL Server was designed to help give continuous OLTP application availability 24 hours a day, 7 days a week.

It handles maintenance operations (backups, diagnostics, design and integrity changes) while all other applications continue to run.

It protects against loss of integrity during a system failure so that all changes to the database can be rerun quickly and accurately.

It also supports fault tolerance in media failures even when the hardware doesn't.
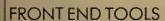
Sybase's professional services division, SQL Solutions, focuses exclusively on providing relational database services and tools.

SQL Solutions provides customized solutions with a complete line of SQL productivity tools that ease every step of the application development life cycle.

SQL Solutions' products support all major DBMSs across all major hardware platforms. The firm has designed, developed and integrated more relational systems in the on-line enterprise-wide network computing arena than all of the leading RDBMS vendors combined.

NEW PRODUCTS — SOFTWARE

Development tools

Sunrise Software Systems, Inc. has announced a graphical user interface system that provides users with an interface to the X Window System and the Open Software Foundation's Motif.

The EZX Version 2.0 for Motif interface contains three modules: Ezxdraw, which interactively designs Motif or Sun Microsystems, Inc.'s Open Look user interfaces; Ezxlib, a library that provides an interface to application programs that is independent of a windowing system; and Ezxdemo, which demonstrates a user interface without the need for programming.

Pricing for EZX Version 2.0 begins at $3,500 for a single-user version.
Sunrise
1151 Aquidneck Ave.
Middletown, R.I. 02840
401-847-7868

Oracle Systems Corp. has added an integrated graphics application product to its generation of application development tools.

Oracle Graphics provides users with graphic analysis of time-varying database information. Its point-and-click interface enables nonprogrammers to create more than 50 charts and change more than 60 chart parameters, the vendor said.

It can run on X Window System, Digital Equipment Corp.'s Decwindows or the Open Software Foundation's Motif. It will be available for DEC's Vaxstations in the third quarter.

Pricing ranges from $1,400 for a single-user license for use on Sun Microsystems, Inc. Sun-3 and Sun-4 workstations to $19,000 for a 64-user license.
Oracle
20 Davis Drive
Belmont, Calif. 94002
415-598-8000

Inter-Data Computer Services, Inc. has announced a programming interface for IBM's Restructured Extended Executor (Rexx) language and SQL.

DB2REXX/TSO can embed SQL statements in a Rexx program, and SQL commands can be issued by using a command window, which displays results of single-screen or multiple-screen queries in a scrollable format, according to the vendor. The product requires a hardware configuration that can run on MVS/XA or MVS/ESA, IBM's TSO/E Version 2 or higher and DB2 Version 2 or higher.

A software license for the product costs $12,500 per mainframe.
Inter-Data
Suite 107
2500 Maitland Ctr. Pkwy.
Maitland, Fla. 32751
407-660-0004

Training

Computer Systems Research, Inc. has announced its MVS Diagnostics Laboratory, a series of video, computer-based course modules and software components designed for use by MVS systems programmers.

The system comprises three segments: an MVS/ESA Problem Determination Environment, an IBM Interactive Problem Control System (IPCS) and a CSR Diagnostic Procedure. The IPCS enables programmers to resolve system outages more effectively, according to the vendor.

MVS Diagnostics Laboratory costs between $10,500 and $20,000, depending on the license type and number of users.
CSR
P.O. Box 45
Avon Park South
Avon, Conn. 06001
203-678-1212

System software

SDC Software, Inc. has announced Release 3.3 of its Standard Purchasing System for IBM System/36 and Application System/400 computers.

The enhanced software package includes integrated code look-ups and enables users to search for items by description, category or alternate item number. The product also allows users to enter multiple general-ledger numbers per line item, enter nonpart numbered items and assign purchase order numbers, according to the vendor.

The price is $4,000 for a license and source code.
SDC
P.O. Box 3360
Carson City, Nev. 89702
702-883-9339

BMC Software, Inc. has announced Release 2.2 of Data Packer/DB2.

The product can be installed on an IBM MVS/XA or MVS/ESA system in less than one hour without an initial program load or DB2 outage, the vendor said. Pre-generated Editprocs and a facility to generate customized Editprocs to compress different types of data are provided. A data integrity feature provides a facility for automatic backup and recovery of customer-generated Editprocs.

A perpetual license for Data Packer/DB2 ranges from $15,000 to $57,500, depending on the type of CPU.
BMC
P.O. Box 2002
Sugar Land, Texas 77487
800-841-2031

Window pains

It's a strange thing in a technology industry, but nobody in the computer business uses something when it first comes out. Unix took 20 years to reach its current level of popularity. IBM's Micro Channel Architecture is only now getting respect after three years of availability.

As for Microsoft's Windows, it has taken more than seven years to hit its stride. After years of justified derision, people are starting to say nice things about Windows — particularly Version 3.0, which is reportedly on the verge of shipping.

Calling it 3.0 is apropos because the system has three modes. It retains the old, Intel 8086-oriented real mode, which is the one everyone always complained about and the reason OS/2 was built. Still being 640K-byte bound, real mode is the dumbest, most limited personal computer mode known to mankind. Still, some people use kludgy schemes that fool the computer into thinking it has more than 640K, which allows them to run memory-hogging Windows applications. Real mode has always been Win-

IBM not singing the OS/2 blues

Soyring downplays problems, says solid sales are grounds for optimism

It's too soon to call OS/2 a disappointment — at least at IBM, according to John Soyring, director of IBM's Austin programming center. Moreover, Soyring, who can be called Mr. Extended Edition, claimed that IBM met all sales expectations for both OS/2 Extended Edition and OS/2 LAN Server in the latter half of 1989 and is exceeding expectations so far for 1990.

In a recent interview with Patricia Keefe, Computerworld's *Senior Editor of PCs & Workstations*, Soyring talked about which IBM customers are buying OS/2 and why. He also addressed the backbiting between the Microsoft Corp. Windows and OS/2 camps and offered advice to those wavering between Windows and OS/2's graphical user interface.

Are users waiting for applications or for OS/2 2.0?
I think a large number of people are satisfied with the functionality that OS/2 is offering today. Availability of applications is key, but you'd expect tool kits to

Soyring says *many users are 'satisfied' with OS/2's offerings*

come out first because developers need them.

Is your typical OS/2 customer a corporate developer building a business application or a power user?
I see a mix of both. OS/2 Extended Edition offers a tremendous opportunity to offer applications difficult to introduce into any DOS environment. We work with a large number of corporations that recognize that by automating large business processes, they can get a larger return on investment than before.

But there are still a large number of personal productivity application users who find large

Microsoft revitalizes project management

BY CHARLES VON SIMSON
CW STAFF

REDMOND, Wash. — Microsoft Corp. announced a graphical entry last week into the sleepy market for personal computer management software. Microsoft Project for Windows was seen by both analysts and early users as good enough to give the application category a new lease on life.

"We have had a number of bad experiences with computerized project management. Our users used to see it, scream and run away," said Mark Dulle, manager of decision support systems at Mervyn's, the Hayward, Calif.-based retail chain. Mervyn's was a beta-test site for the product.

"The graphical strength of Windows, as well as the flexibility Microsoft has built into it, makes it a platform on which we can standardize," he added.

Analysts saw the product's ease of use as a significant advantage over competitive offerings, but they cautioned that project management is by nature a complex process.

"The product is easier to use than any spreadsheet," said Daniel Yahdav, president of 1 Soft Decision, Inc., a San Rafael, Calif., project management consulting company, "but users should still expect a substantial learning curve. Even with a PC,

managing a project is more an art than a science."

Yahdav said that many of the barriers to implementing project management systems had nothing to do with the technology. "As long as specific plans and schedules are fuzzy, they can be changed without anyone knowing," he said, "but if you add a computerized plan that anyone can read off the network, you are accountable. There can be a lot of resistance from managers."

Helpful Windows
The Windows version of Project adds substantial functionality to many of the program's capabilities. The ability to add fields, support numerous charts and output modes and exchange data with other Windows applications has been improved.

Two areas, however, disappointed users and analysts. The first is that the initial version of the product, available from re-

sellers later this month, will not include support for Microsoft's SQL Server database server. While the system will allow multiple users to access a file, it will not allow full file sharing or cooperative processing.

"That is somewhat frustrating," Dulle said, "There is really no such thing as a stand-alone PC anymore, and we are looking forward to support for SQL environments."

In addition, the system will not support Windows' Dynamic Data Exchange capability. While the system will allow for data to be transferred between applications via the clipboard function, Dynamic Data Exchange support will wait for a later edition. "That was simply one of the trade-offs we had to make to get the product out," a Microsoft spokesman said, "but [Dynamic Data Exchange] is extremely important, and we will get it in a later release."
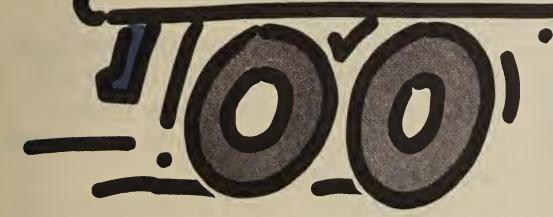
Before Roadway's trucks make deliveries across the country, their computers do. With a Networke
deliver loads of information to customers in seconds. And stay on top of the trucking business. Ca

In the stock market, insider information is a crime. In the OS/2 market, it's a blessing.

Now you can invest in futures and get the edge on your competition, all at the same time.

With the OS/2 version 2.0 Software Development Kit program.

OS/2 v. 2.0
Software Development Kit

PRE-RELEASE

It has everything you need to jumpstart your new 32-bit applications. And take full advantage of Intel's 386™ and *i* 486™ processors.

Not to mention OS/2's graphical interface, multi-tasking and advanced memory management.

You get successive pre-releases and final versions of 32-bit OS/2, Microsoft® C and MacroAssembler.

You also get Microsoft's improved CodeView® debugger.

Access to your OS/2 network while you're developing code.

And of course, expert on-line technical support.

Call (800) 227-4679, Dept. L79, to find out more. And do it now.

The early bird gets the application.

Microsoft
Making it all make sense™

Building on a Systempro base

Construction firm uses network with Compaq, Microsoft foundation

BY RICHARD PASTORE
CW STAFF

PARIS — Europe's No. 2 construction company did not put up the Eiffel Tower, which punctuates the skyline two miles from its headquarters here. It missed out on the Arc de Triomphe as well. But the Dumez Group is laboring to erect its own monument to distributed processing using the latest technology tools — Compaq Computer Corp.'s multiprocessor Systempro and Microsoft Corp.'s OS/2 Version 1.2.

Alain Vignon, manager of personal computing at Dumez's Paris headquarters, bought the department's first network server two years ago — a Compaq Deskpro 386. "We chose Compaq because they had a bigger product line," Vignon said.

Today, the building runs 11 networks, and 95% of its 250 personal computers are Compaqs. So it was a natural "evolutionary step" to buy two Intel Corp. 80386-based dual-processor Systempros in December, Vignon said.

"With the speed at which hardware becomes obsolete, I'd rather invest in a Systempro and stay ahead of the curve," Vignon said. "If you compare the Systempro to a regular Compaq file server, the Systempro is less expensive in terms of evolution and path for growth."

Careful shopper

Vignon has also made some paper comparisons with IBM's new Personal System/2 Model 80 servers. "In theory, I think you would find quicker disk access time with [IBM's] Micro Channel Architecture," Vignon said.

However, he said, he chose to look at the bigger picture: "Compaq gave us the chance to do disk mirroring, something IBM never offered us."

Dumez's Systempros are each configured with 4M bytes of system memory, Novell, Inc.'s Netware 386 software and 15 PC nodes. The networks talk to the department's IBM 4381 mainframe via IBM 3270 gateways.

Installation was no more difficult than with any other file server, Vignon claimed, and Netware was easy to load. The only trouble so far came when he accidentally tried to run a Compaq 32-bit token-ring card with an incompatible Proteon, Inc. token-ring driver.

Currently, the boxes are running word processing, spreadsheet and accounting packages. Vignon will really put the processors through their paces next month when he migrates intensive payroll applications off the mainframe.

Another networking cornerstone rests on OS/2. Six members of Vignon's staff of 30 have spent 18 months developing an OS/2 version of the firm's mainframe-based cost-estimate application. By the end of the year, this program will run on the Systempro networks, as well as the firm's few PS/2 stand-alones and Toshiba America Information Systems, Inc. laptops.

The cost-estimate program allows users to play "what-if" games to determine the cost for a construction project. The heart of the application is a 5,000-item materials database with unit prices for everything from washers to windowpanes.

Cost savings are not the primary reason for the migration efforts. "I don't know if it will save money," Vignon admitted. "It will lower the charges on the mainframe, but we will have to invest more in PC training."

End users are actually driving

With the diverse *architecture of the Louvre for inspiration, Dumez's Vignon steers construction course*

Steve Murez/Black Star

ken-ring driver.

the migrations, Vignon explained. "Users want to work on a PC rather than a terminal; they want to be in a more user-friendly environment," he said.

Vignon said he does not expect the networks to replace his mainframe or even his IBM Application System/400 midrange machines. The sticking point is software — packaged construction applications are so demanding that they require machines with larger throughput capacity.

Also, Dumez's worldwide presence requires a hardware vendor with worldwide support. Dumez India opted for an AS/400 because "IBM was in New Dehli; the nearest Compaq people were only in Pakistan," Vignon said.

Buy-back plan reaps treasure from trash

BY JAMES DALY
CW STAFF

FULLERTON, Calif. — Pity the original Macintosh. Considered a marvel of user-friendly engineering when Apple Computer, Inc. introduced it in 1984, the machine drew critical raves and a wildly enthusiastic following within weeks of its arrival.

But six years after its debut, the former toast of the industry seems a prehistoric relic. The machine's rudimentary configuration of 128K bytes of standard system memory and one floppy slot now make it seem more like a kid's toy than a serious business machine.

One man's junk, however, is another man's treasure. At least that's what Hughes Aircraft Co. is discovering.

The aeronautical equipment manufacturer has arranged a buy-back program with computer retailer Businessland, Inc. under which Hughes will trade in about 1,000 aging personal computers, including many original Macs, and get substantial credit toward the purchase of new Macintosh and IBM systems.

The swap could not come at a better time for Hughes. Like many firms in the rapidly shrinking defense industry, Hughes has become hard-pressed to cut costs and improve productivity yet prevent computer equipment from becoming obsolete.

"It's very difficult for us to justify getting rid of equipment until it breaks or is no longer usable," said Mary Howlett, a manager in the ground systems group where the trade-in will take place. "Yet a lot of our PCs are old and no longer capable of running any of the new applications coming out today."

Howlett said that credit values have been assigned to 21 different styles of computers and peripherals, including several Apple models as well as IBM Personal Computers and XTs

and assorted Hewlett-Packard Co. machines. These will be traded for Macintosh IICXs and SEs as well as IBM Personal System/2 Models 55 and 20.

After picking up the older machines, San Jose, Calif.-based Businessland will in turn resell the machines to Dana Commercial Remarketing, a nearby reseller that will refurbish the systems and sell them at cut-rate prices overseas.

"WITH A buying moratorium, you tend to get pretty creative."

JIM LAW
APPLE COMPUTER

The reworking at Hughes is part of a sweeping in-house inventory rearrangement, according to Hughes purchasing manager Tom Croom. In May 1989, a computer purchase moratorium was imposed after a study reported that the employee-to-machine ratio was a bloated 2-to-1.

Suppliers soon began scrambling to keep the Hughes account alive. "With a buying moratorium, you tend to get pretty creative," said Jim Law, a national account executive at Apple, who helped arrange the buy-back plan.

The buy-back plan proved to be an attractive option to higher-ups in Hughes management, and the moratorium was lifted for replacement parts, Howlett added.

Participants said the deal comes up with only winners: Hughes gets a savings of up to 15% over its already substantial volume discounts, Businessland maintains a high-profile presence inside Hughes through an extensive installation service plan, and Apple sells up to $8 million worth of equipment.

As Fast As
And You Can

NCR

PC486/MC

It Gets.
Get It Fast.

The NCR PC486/MC is one fast machine. *PC/Computing* reports "the PC486/MC is on the front edge" of 486 desktops.* With its dual high-speed cache design, the system takes full advantage of the performance potential of the i486™ microprocessor. And its implementation of Micro Channel™ architecture makes it the clear leader in providing full 32-bit performance.

According to *BYTE* Lab benchmarks, the PC486/MC's "mass storage subsystem (with a 100MB SCSI hard drive) turned in the fastest performance we've ever measured."*

Standard Features
i486 Native Design
•
Micro Channel Architecture
•
128KB Of High-Speed Cache Memory
•
SuperVGA Display Adapter
•
Small Computer System Interface (SCSI) Multi-Peripheral Controller
•
Worldwide Service and Support
•
Available *Now*

Our PC is the only native design 486 Micro Channel machine from a major vendor now available. We've not only released it for sale, we're delivering it in volume. The competition will eventually release a native-design 486. But how long will it be before they can deliver?

The PC486/MC is ideal for MIPS-hungry applications like large spreadsheets, financial modeling, simulations, CAD, and networking.

It's the first of a family of advanced PCs that will lead the market in speed, power, and availability.

Our PC family also includes high-performing 286™ and 386™-based PCs. Backed by the resources of a $6 billion computer company with service and support in nearly every country in the world. And a commitment to quality that is unequaled.

Call 1 800 544-3333 for a free six-page 486 PC comparison brochure. We'll also put you in touch with the NCR or Businessland representative, or other Authorized NCR Reseller nearest you.

NCR

Open, Cooperative Computing.
The Strategy For Managing Change.

Barney

dows' biggest pain.

Windows 3.0 also has an DOS-compatible way of addressing protected mode — in other words, it can treat up to 16M bytes of random-access memory as directly addressable linear memory. Unlike OS/2 or Unix, this mode is single-tasking-oriented. These features were pioneered by a class of products called DOS extenders.

While it is no big thing in other environments, this is an entirely new mode for Windows and the real reason that users are excited.

The third mode, pioneered by Windows/386, is called virtual mode, and it allows the user to run multiple dumb real-mode sessions simultaneously. There are a few problems, however — it only works on an Intel 80386 or I486, and it only allows users to multitask applications that work in antiquated real mode.

Because the IBM PC is single-processor-oriented, once a user begins to multitask applications of any significance, the PC will bog down anyway.

But Microsoft has some clever folks. To keep applications from bringing the otherwise snappy 80386 to its knees, they built in a time-slice scheduler. The user can determine how much processor time is allocated to each task. Then, the

L IKE MANY Microsoft projects, Windows 3.0 has generated a fair share of controversy.

report for the boss can be given priority, and the spouse's newsletter can be put on the back burner, or vice versa.

Like many Microsoft projects, Windows 3.0 has generated a fair share of controversy. For years, Microsoft pooh-poohed all the so-called DOS extenders. Then Microsoft used this same technology to allow Windows applications to cleanly exceed 640K. Worse still, Microsoft created its own DOS extender, even though other vendors such as Lotus and Borland were already using proven, semi-standard technologies.

This point, however, irked only the small companies. It was the very use — proprietary or not — of DOS extenders that had the big guys steaming. Lotus, for instance, has dumped an estimated $40 million into OS/2 development with the belief that Windows would never rival its bigger graphical brother's features. Wrong.

Windows 3.0 has left firms like Lotus in the lurch. They are

stuck with tons of code for OS/2 but little for Windows, which customers finally care about.

Although some of these firms have publicly blamed Microsoft for these foibles, it is not its fault. Microsoft has passionately, zealously and relentlessly told developers to write for Windows. If any missed their opportunities . . . well, that's just too bad.

Windows 3.0 also sparked a vicious debate over the transition to OS/2 Presentation Manager. Some say that Windows 3.0, by mirroring Presentation Manager's features, will hold up the migration. That's silly. The move to Windows 3.0 can only help Presentation Manager. Both systems require an 80386 to be effective. Both need lots of RAM. And both need high-

resolution graphics. You can still upgrade from Windows 3.0 to Presentation Manager.
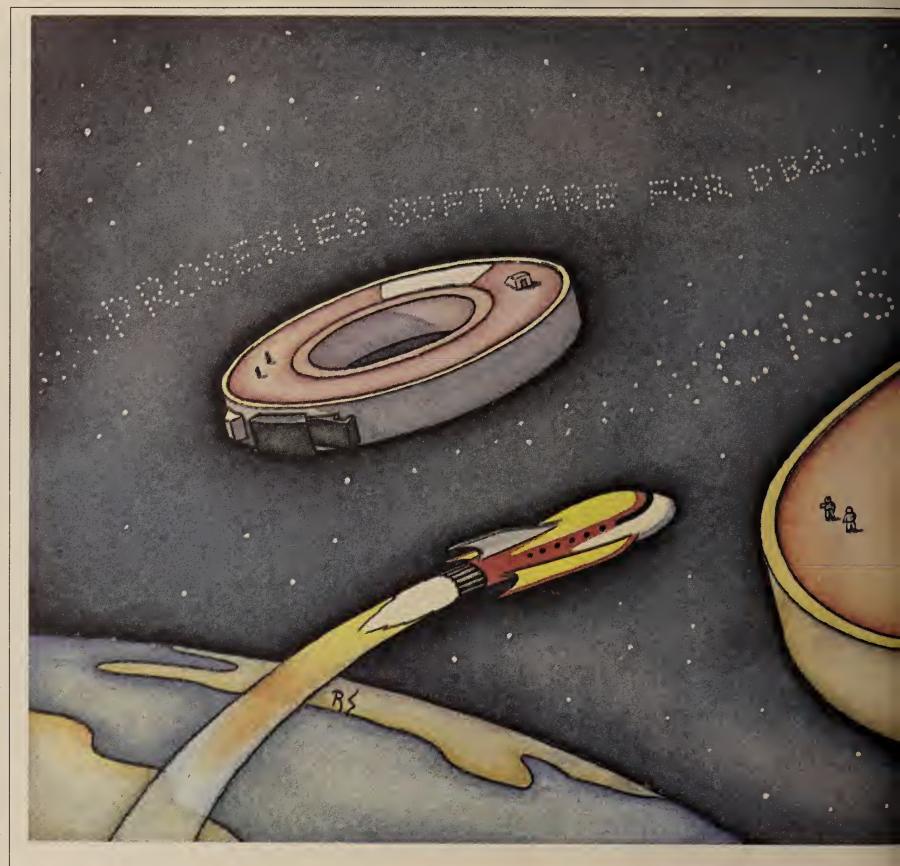
However, while Windows 3.0 should serve many applications well, it is not up to Microsoft's more aggressive public goals, particularly as a multimedia operating environment.

Multimedia requires both multitasking (how else could you load animation, synch it to

sound and add text overlays?) and a large linear address space for complex moving images.

Unfortunately for multimedia users, Windows 3.0 is only an either/or environment. However, it should have plenty to offer for most spreadsheets, databases and word processors.

Barney is editor in chief of Amiga World.

Soar To New Heights In CICS And DB2 Productivity.

Get off to a flying start with On·Line Software's new CICS Productivity Center and ProSeries Software for DB2.

CICS Productivity Center was introduced to meet the five most critical needs identified by CICS shops. Unlike other "product integrations" that only offer a superficial main menu that passes control to individual products, CICS Productivity Center gives you true interaction for faster,

easier testing and debugging, quality assurance, system stability, application development, data recovery and on-line resource management.

ProSeries Software is a group of products that makes it easier to work with DB2. With ProSeries you can manage DB2 objects without SQL. With its ISPF-like interface, you can test DB2 applications more efficiently. And since it also lets you embed SQL directly into

Oracle keeping up with the databases

BY CHARLES VON SIMSON
CW STAFF

BELMONT, Calif. — Oracle Systems Corp. recently shipped its Professional Oracle Version 5.1C database and development tool kit. The newest version includes several new features that pull the respected Oracle database server closer to the usability offered by other vendors.

"PC databases have a tough job because they have to be easy for both the software developer and the end user to use," said Allen Taylor, an independent personal computer software analyst and consultant based in Westminster, Calif. "There has been a major shift in the user base toward nontechnical people. If you don't get a sophisticated interface together, you are not going to survive."

Oracle has added a menu-driven command shell that allows users to start Oracle tools and remote databases from a central control panel. The system can be preconfigured so that end users do not need to know the location of the remote database. The system can also be customized by users to function as a general-purpose DOS shell, allowing them to start applications or batch files.

Version 5.1C also supports the Microsoft Corp. Windows 286 device driver in character mode under Windows 286.

"This is our response to demands from customers for increased ease of use," said Mark Benioff, director of Oracle's desktop products division. "The proliferation of networks is sending databases out to nontechnical business people. That is obviously a trend we want to support as much as possible."
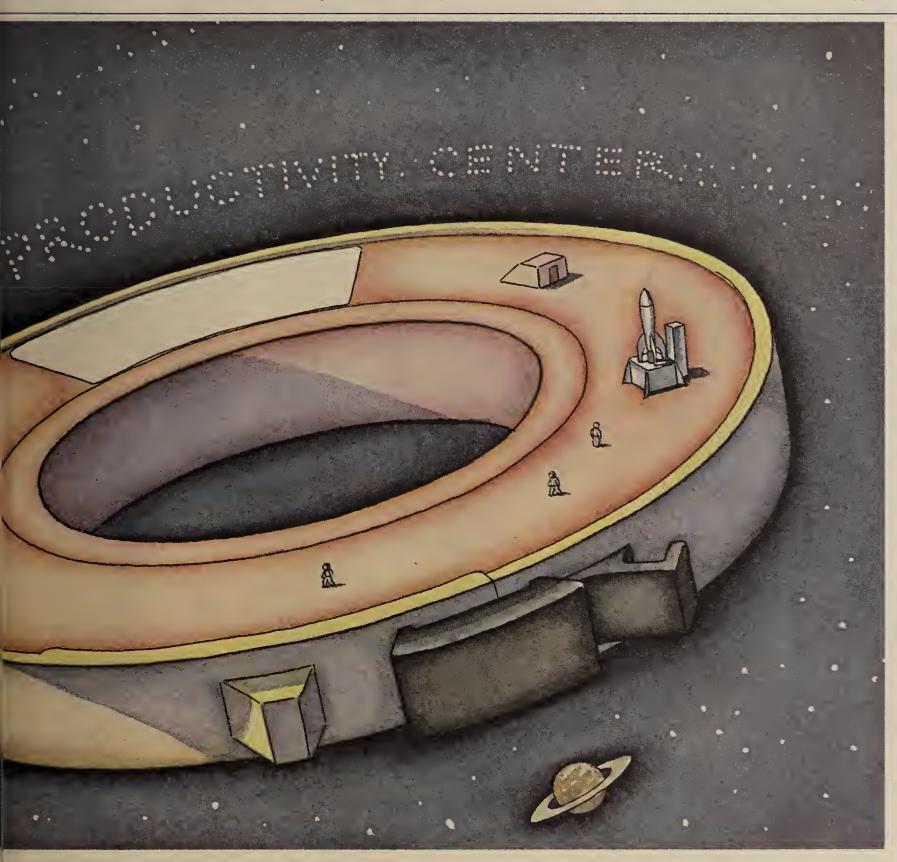
But while the system is a solid improvement over previous character-mode versions, Oracle is still behind the development effort taking place at Gupta Technologies, Inc., which has demonstrated its SQL Windows product fully supporting the Windows 3.0 character mode. Gupta is seen by most analysts as the leader in interface design.

"Gupta has a lead in graphical, menu-driven systems," Taylor said, "but given that Oracle has traditionally played to other strengths, they are making significant progress."

Oracle has not traditionally competed on the basis of ease of use, an area that is really only beginning to move into the decision process for many would-be database purchasers. The strength of the system continues to be its availability on a broader range of platforms than its competitors, making it easily portable to a range of operating systems across hardware categories.

In addition to the interface enhancements, Version 5.1C has been redesigned to include support for third-party memory managers such as Compaq Computer Corp.'s CEMM system. The new version has an improved installation procedure.

Professional Oracle Tools and Database Version 5.1C require MS-DOS 3.0 or higher, with a minimum of 640K bytes of random-access memory and a hard disk. It includes several utilities and is priced at $1,299. Tools alone is available for $799.

My network in marketing won't share

Now what?

The latest directive from senior management is a doozy. Marketing and manufacturing must now share applications. As for all those different PCs and systems in place, management is "confident you can meet that challenge without incurring significant additional capital expense."

Now what?

For many corporate managers, the answer to that question is 3Com® 3+Open™ systems. 3+Open systems start with LAN Manager, co-developed by 3Com and Microsoft, and include the most extensive range of connectivity and electronic mail products.

It's a powerful computing platform with the flexibility to support both current business applications and emerging client-server applications.

3+Open systems let your people share information whether they use a PC, Macintosh, IBM, DEC,

with the network in manufacturing.

HP or Bull host. What's more, 3+Open systems are compatible with DOS, OS/2, UNIX and Macintosh applications.

To enhance your network performance and security you can run 3+Open systems on 3Com 3Servers,® network servers designed exclusively for networks.

The result: a system that can actually leverage the value of the information anywhere in your company.

To find out how 3Com 3+Open systems are working in major corporations around the world, just call **1-800-NET-3Com**, Dept. D5014. You'll also receive a brochure on 3+Open client-server systems.

At 3Com we make internetworking products and wide area networking products, as well as adapters, operating systems and servers. Because what good is sharing along one part of the network if you can't rely on the rest of it as well?

3Com

We network more types of systems
to more types of systems.™

Soyring
CONTINUED FROM PAGE 39

gains by going to OS/2.

Can you respond to complaints that IBM and Microsoft are confusing the industry?
I don't know of one instance where we made an announcement and changed it. Our strategy is to continue to support OS/2, and we have made our investment in that system accordingly. Our relationship with Microsoft is a strong one. As in any relationship, we will continue to evolve how we work together. Neither company has ever said [we would] hand over OS/2 development to Microsoft.

What about the announcements regarding Windows at Comdex/ Fall '89 in November?
When we make an announcement, it's a clear position statement. Relative to the functions that will be in Windows, we said there would be no threads, no defense security, no 32-bit model, flat addressing space or full object-oriented support — these will be in OS/2 only.

Many users and OS/2 developers say you need more than 1M byte of memory — Microsoft's "design goal" — to run Windows.
As far as I know, Windows is for entry-level machines, meaning up to 2M bytes of memory and a 30M-byte hard disk. There is a large installed base of [Intel Corp.] 286 and 386 machines that have limited disk storage and real memory whose owners do not plan to upgrade those machines. Windows is a very good environment for that. It all depends on your expectations and on the memory requirements of your applications.

So when do you go to Windows vs. OS/2?
Windows might be fine for some limited sets of applications. But where you need preemptive multitasking and protected mode, and have applications that require a higher level of performance in the system, then go to OS/2.

How will Windows 3.0 impact OS/2?
My personal opinion is that I view Windows as a positive thing that will help sales of OS/2 by making a graphical user interface available to a larger number of users. I do think Windows 3.0 will delay some user migration to OS/2, because you now have the capability of running a [graphical user interface] on entry-level machines, as well as on more powerful machines.

Users are using Windows as a transition tool to provide a graphical user interface and a common set of applications. So from the standpoint of the cost of training users, corporations can minimize costs if [the Windows and OS/2] interfaces look similar.

Take Microsoft's Excel for Windows and Excel for OS/2 — there's a lot of synergy there. And whenever you have an entry-level configuration of a machine or system that is consistent with the high end, it helps overall sales.

Is there a silver bullet that will launch the OS/2 market?
No. I think [what will launch the market] is a variety of products, like [Lotus Development Corp.'s] Notes and 1-2-3/G, Excel and [IBM's] Officevision. When you start putting these applications together, you provide a powerful office environment.

Users and developers have complained about the limited support for DOS under OS/2.
The 32-bit version of OS/2 is very attractive. It offers a better DOS than DOS does today by providing more address space for each virtual DOS machine and expanded memory. It will allow each DOS application to run in protected mode. As for the 16-bit version of OS/2, a large percentage of [DOS] applications do run in it, despite its limitations. It hasn't been a major issue among customers.

Silicon Graphics drops price of Iris workstation

MOUNTAIN VIEW, Calif. — Silicon Graphics, Inc. has announced that its Personal Iris 4D/20 visual processing workstation is now available for the reduced price of $10,000 in hopes that it will attract a larger and more diverse cross-section of creative design professionals.

Anticipating that the lower price point will allow a broader set of developers to bring their software to the Iris platform and subsequently expand the visual processing market, the vendor listed reduced component and manufacturing costs and an increased demand for volume shipments as the impetus behind the price reduction.

The system, which is aimed at the color publishing, computer-aided design and computer-aided engineering markets, allows scientists, engineers and designers to incorporate both color and real-time three-dimensional graphics into computing applications.

Silicon Graphics also announced that the price of the 4D/25S Data Station computer and file server has been reduced to $5,900. All new pricing is reported to be effective immediately.

Just when Power Seekers thought they had nowhere left to go...

Introducing the

Computer show to strike Moscow

FRAMINGHAM, Mass. — The Soviet Union, perhaps the world's largest untapped computer market, will open up July 10-15 to Western personal computer vendors in Moscow when International Data Group's World Expo Corp. hosts 50,000 Soviet officials and business professionals with hard currency to spend on PCs and software at PC World Forum/Moscow.

The exposition is the only certified U.S. Department of Commerce trade show to be held in the Soviet Union this year. PC World Forum/Moscow will also be the first chance for Soviet software developers to meet with international vendors and development experts.

Once the expected changes in intellectual property laws are passed, Soviet software is expected to be a major form of countertrade.

Although the Soviet Union has only 300,000 PCs, Moscow officials predict demand will reach 28 million by the year 2000; considering existing Soviet production facilities, the majority of those systems will have to be imported.

The opening two days of the show are reserved exclusively for Soviet executives identified as volume buyers.

Included among the speakers at the July 11-12 Software Development Conference will be Bradley Homes, director of the U.S. State Department's Bureau of International Communications and Information Policy; Bernard Vergnis, vice-president of Microsoft Europe; and Esther Dyson, an industry consultant.

MICRO NOTES

PC base doubles in Fortune 1,000

The average multisite Fortune 1,000 corporation had installed 2,287 personal computers by the end of 1989, a 133% growth rate from 1987, according to a recent study by **Computer Intelligence.** A similar survey that had been conducted in 1988 showed an average installation of only 982 PCs per company by the end of 1987.

The PC growth rate was found to vary among vertical markets, ranging from a low of 48% in the life insurance sector to a high of 230% in the diversified services segment.

CI also said that these organizations are on average planning to purchase another 185 PCs this year. The survey is based on interviews with 26,900 sites associated with 949 of the Fortune 1,000.

McDonnell Douglas Corp. will resell **Hewlett-Packard Co.'s** reduced instruction set computing-based 9000 workstations under a three-year, $75 million value-added reseller agreement signed by the two companies last week. McDonnell Douglas will package its own Unigraphics software on the HP platforms and said that it will continue to target the computer-aided design/computer-aided manufacturing market, in which it has successfully teamed with HP in the past.

Dial-a-DOS from Microsoft

BY CHARLES VON SIMSON
CW STAFF

REDMOND, Wash. — Microsoft Corp. has established a 900 number to provide MS-DOS technical information that evaluates the potential for turning a profit from telephone service. The process is the first for a major software vendor, but several others are expected to follow.

"Up until now, 900 numbers have meant dial-a-porn and other silly stuff," said Richard Farmer, director of systems and marketing in the product support services unit at Microsoft.

In the near term, the 900 number will provide information and technical support to DOS customers for $2 per minute. Farmer said he expects that the 900 service will break even, but he is looking for profit opportunities in other areas. In the long run, the current service will provide a laboratory for testing the service and marketing possibilities of 900 numbers.

Farmer said that the system was running near capacity but that customers were experiencing no delays in reaching the eight technicians staffing the phones. A sample call placed by *Computerworld* was answered promptly.

Because Microsoft licenses DOS only to OEMs, product support has traditional-ly been the responsibility of equipment manufacturers. The distribution channel, however, is coming under pressure from software publishers. "Resellers and dealers simply don't provide the level of support that customers need," Farmer said. "We will study the ways customers use the service to look at the best value-add potential."

Microsoft will also look at the potential for telephone consulting on more sophisticated topics such as systems development and billing for its expertise. "There is simply no good research on how people will use this kind of information or what they will pay for it," Farmer said.

Lotus Development Corp. and Aldus Corp. have said they, too, will offer 900-number customer support.

This is what typically happens to people about

It starts almost immediately. You see menu commands you already know. Which, to a Lotus® 1-2-3® user, is a comforting sight. You use the familiar 1-2-3 keystrokes. No surprises there. You realize that it feels like 1-2-3 because it is.
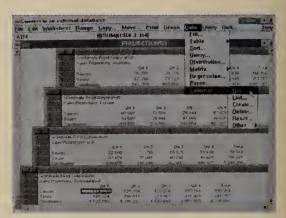
But wait, there's a mouse. And pull down menus and dialog boxes and a WYSIWYG display. Which is where things suddenly start getting exciting.

Like 1-2-3 Release 3, 1-2-3/G™ offers true 3D worksheets, file-linking, direct access to external databases, and network support. And through its graphical user interface, plus a host of new features, 1-2-3/G becomes a powerful analytical tool that is extremely easy to use and responsive to the way you work.

You discover an exciting new feature called Solver, an advanced goal-seeking technology that gives you an amazing short-cut to solve complex "what-if" business problems. In seconds, Solver shows you "how-to" achieve your desired results, based on the variables and constraints you put into your spreadsheet.

And when you're ready to present your results, you'll find a

Whether it's working with a 3D file or bringing in information from external databases, the power of 1-2-3/G is always within reach.

variety of dramatic new graphing capabilities that will help you make your point with clarity and impact.

Plus, 1-2-3/G takes advantage of the speed, large memory, and multi-

NEW PRODUCTS

Macintosh products

Microtech International, Inc. has announced a 16M-byte memory upgrade package for Apple Computer, Inc. Macintosh systems.

The package consists of Microtech's 4M-byte single LU line memory modules and Maxima, a memory management software product from Connectix Corp. The bundled product enables Macintosh users to use graphics and audio editing programs as well as perform large database and spreadsheet tasks.

The list price is $699 per module.

Standard modules are available for the SE/30 and Mac IICX and IICI units.
Microtech
158 Commerce St.
E. Haven, Conn. 06512
203-468-6223

Fontina, a software product that improves font menus in Apple Computer, Inc. Macintosh programs, has been announced by Eastgate Systems, Inc.

The product upgrades Macintosh system software so that multicolumn menus are used instead of scrolling fonts, the vendor said. The software includes a feature in which related font families are grouped together and allows for all installed fonts to be displayed at once.

Fontina has a retail price of $69.95. A complete office package that includes 10 copies of the program is available for $295.
Eastgate
P.O. Box 1307
Cambridge, Mass. 02238
617-924-9044

Software utilities

Invisible Software, Inc. has begun shipping an expanded memory manager for Intel Corp. 80386-based personal computers.

Invisible RAM 386 reportedly uses the 80386 chip's built-in memory management functions to create shadow random-access memory and boost DOS memory from 640K bytes to 704K bytes on monochrome systems or up to 736K bytes on color systems.

The product also supports applications programs designed for Lotus Development Corp., Intel and Microsoft Corp.'s Expanded Memory Specification Version 4.0. Invisible RAM 386 costs $59.
ISI
Suite D
1165 Chess Drive
Foster City, Calif. 94404
415-570-5967

Systems

Square 3 Extra, an addition to Reason Technology's line of Intel Corp. 80386-based business computers, combines a 25-MHz 386 processor with 8M bytes of random-access memory in a small footprint system.

It incorporates an IBM Video Graphics Array-compatible graphics card, a color monitor, a 200M-byte, 15-msec 3½-in. hard drive with 64K bytes of cache memory, a 1.2M-byte floppy drive, two serial and one parallel ports and eight expansion slots. Its hard drive features data transfer rates of more than 1M bit/sec.

The system's introductory price of $3,695 includes a one-year warranty and a 30-day, money-back guarantee.
Reason Technology
290 Coon Rapids Blvd.
Minneapolis, Minn. 55433
612-780-4792

Square 3 Extra *extends Reason Technology's 386-based business line*

CCS Custom Computer Systems, Inc. has announced a computer system that has been built around a Mylex Corp. motherboard.

The CCS:38625C personal computer uses the Mylex MWS386-25 IBM AT form-factor motherboard to incorporate cache random-access memory architecture using 64K bytes of 25-nsec static RAM. The suggested list price ranges from $4,500 to $10,000, depending on hardware configuration.
CCS
191 Woodport Road
Sparta, N.J. 07871
201-729-6762
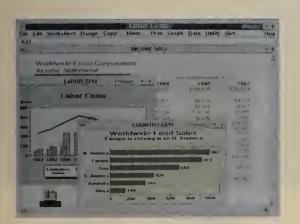
Fortron/Source has introduced the Netset 386SX, a 16-MHz Intel Corp. 80386SX-based system that can handle 32-bit software applications.

The system can be expanded to contain 8M bytes of random-access memory and can incorporate an Intel 8387SX coprocessor when needed.

The system sells for $1,295.
Fortron
6818-G Patterson Road
Livermore, Calif. 94550
415-373-1008

You're looking at your largest technology investment. What a shame you've had to expend most of it working around the limitations of conventional databases.

Fortunately, Ingres has changed all that by introducing the first intelligent database.

We call it intelligent because it helps organizations operate more intelligently. In short, it gives you the ability to manage not just data, but knowledge and objects as well.

The unique Ingres Knowledge Management™ facility lets you manage business policies or
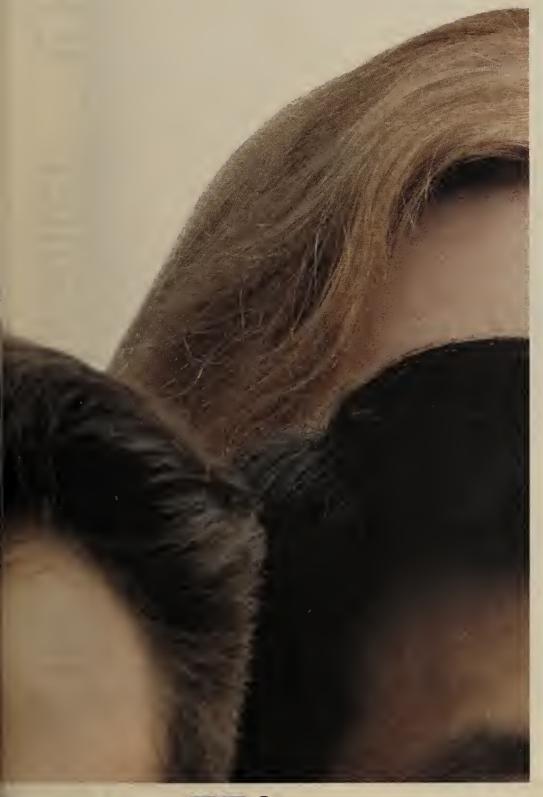
Finally. A database to free-up all this v

rules—and referential integrities—inside the database server. Because this information is centrally enforced and managed, you get complete control of your data and its integrity. And your programmers don't have to write rules and referential integrities in each application.

An unlimited number of rules can be stored in the server. And features like unlimited forward chaining and recursion mean that rules fire when expected.

Ingres Object Management™gives you the ability to manage types of data that are difficult or impossible for conventional databases. User-defined datatypes—like geographic coordinates or manufacturing tolerances—are stored and used within the database server. They can even be manipulated using standard SQL.

Rather than wasting time converting data to fit the constraints of your database, you can teach your database to understand data the way your organization uses it. So your data becomes more relevant to how you do business, and your database more useful than ever.

And as if this weren't enough, the Intelligent Database™also features improved data management capabilities, giving you enhanced performance for OLTP, decision support and distributed processing.

The net result: the Ingres Intelligent Database lets you model the real world—your business—like no other database in existence.

So remember. When you want to get the most out of your most valuable hardware, you have only one intelligent choice.

Call 1-800-4-INGRES to find out more.

Ingres

Intelligent database. Intelligent decision.

intelligent enough
luable hardware.

Software applications packages

Chipsoft, Inc. has released the Massachusetts version of Turbotax for the IBM Personal Computer XT, AT, Personal System/2 and compatibles.

The product reads data from the Turbotax federal data file and uses information from the Turbotax 1040 software package. Once the software is loaded on a computer, users can work on federal and state forms simultaneously by switching back and forth, the vendor said. On-line Help screens and a tax smarts feature are included.

The Massachusetts version of Turbotax requires Turbotax Federal Personal Version 7.01 to operate. The package sells for $40 with annual updates of $25.
Chipsoft
5045 Shoreham Place
San Diego, Calif. 92122
619-453-8722

Eastman Kodak Co. has announced its advanced printing and publishing software Release 1.1 for the Sun Microsystems, Inc. Sun-3, Sun-4, and Scalable Processor Architecture environments.

The product's open, modular design enables users to run a customized mix of publishing and nonpublishing applications in a standard Sun Windows environment. The software allows multiple applications to be run simultaneously and multiple sessions of an individual application to be run concurrently, the vendor said.

The price for a package that includes four modules is $4,000.
Kodak
901 Elmgrove Road
Rochester, N.Y. 14653
716-253-0053

Training

Intellisance Corp. has announced Training for PC-DOS, an interactive computer-based training package offered in single-user and local-area network versions.

The product covers all DOS versions, including 4.0, and is designed to enable users with little or no personal computer experience to learn the basics of working with disks, disk files, tree-structured directories and fixed disks.

The package is being offered for $179.95 per unit. Volume discounts are available.
Intellisance
1885 Lundy Ave.
San Jose, Calif. 95131
408-432-0430

Development tools

Genesis Software Co. has announced a new version of a productivity tool for Cobol programmers and analysts.

Version 1.0 of WS-Report provides Cobol programmers with an interactive editor to create report layouts, documentation editors, formatted mock-up facilities and a working-storage code generator.

The product requires 384K bytes of memory and runs on DOS 3.0 or higher. It is priced at less than $200 per copy.
Genesis
P.O. Box 923
Cypress, Texas 77429
713-469-5753

Sun Microsystems, Inc. has introduced Sunvision, a software package that includes visualization tools and libraries designed for use on its Scalable Processor Architecture (Sparc)-based workstations.

Sunvision provides users with image processing, volume rendering and photorealistic rendering capabilities for Sun's Open Windows application environments. It includes two programming interfaces for developing software for Sparc-based systems, an image processing library and a renderer.

Sunvision is slated to begin shipping in late July with a price tag of $3,000.
Sun
2550 Garcia Ave.
Mountain View, Calif. 94043
415-960-1300

Peripherals

Mouse Systems Corp. has announced a bundled software package that includes its PC Mouse and PC Mouse II high-end optical input mouse products and its Cad-One stand-alone software program.

Cad-One is an all-purpose drawing and computer-aided design tool that allows users to select a specific drawing size and unit of measure before beginning a drawing.

The price for a bundled package that includes Cad-One and PC Mouse or PC Mouse II sells for $169.
Mouse Systems
47505 Seabridge Drive
Fremont, Calif. 94538
415-656-1117
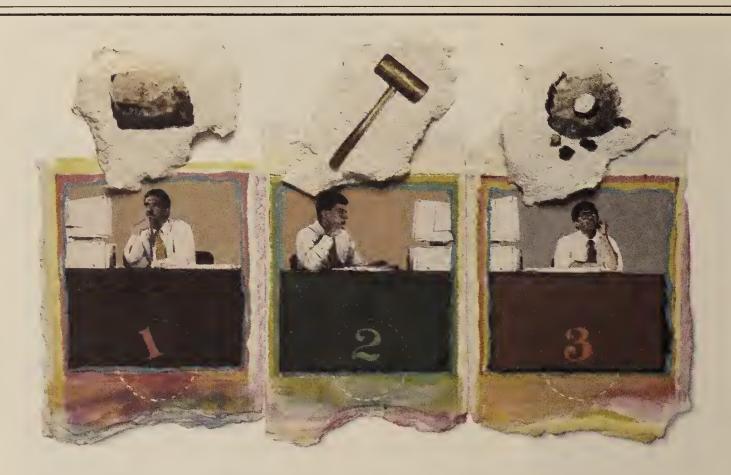
HSD Microcomputer U.S., Inc. has announced a scanner that is compatible with the Next Computer System from Next, Inc.

Scan-X 1600 features 1,600-dot/in. scan resolution for line art and 400 dot/in. for gray-scale images. The scanner also recognizes 256 shades of gray.

The Scan-X 1600 System supports Tag Image File Format. It includes the scanner, small computer systems interface kit and Scan-X software.

The system is available through Businessland, Inc. at a retail price of $4,995.
HSD Microcomputer
2000 Broadway
Redwood City, Calif. 94063
415-367-1797

How Napoleon Won
The Battle Of Waterloo.

On February 26, 1815, Napoleon Bonaparte set sail for France from his exile on the island of Elba. His mission was to restore constitutional rule to his adopted land, an idea that other European monarchs had vowed to fight to the death.

After landing at Antibes on March 1st, he set about preparing for war. A war that would culminate near the tiny Belgian village of Waterloo.

Napoleon knew that, to prevail, he would need to strike first. And he knew that such a tactic would require precise information and an effective way to analyze it. But, with limited resources and little time, a mainframe computer system was out of the question.

Then an aide alerted him to the ideal alternative. Open systems information processing software from Informix.

At the heart of the solution was INFORMIX®-OnLine, the first mainframe replacement database management system.

◆ ◆ ◆ ◆

Before Even One Shot Was Fired, Napoleon relied on OnLine's high capacity to direct the flow of troops and materiel.

OnLine's distributed computing power meant he could successfully avoid information bottlenecks while thousands of transactions were processed at outposts throughout France every minute of every day.

Napoleon soon learned that OnLine could do something no main-

Napoleon's staff combined the Wingz HyperScript® programming language with DataLink to create a customized Executive Information System that could easily retrieve SQL data by clicking on-screen buttons. Napoleon used this system to analyze everything from Wellington's tactical preferences to his social schedule the night before battle.

Early maps of the period indicate that the French held a tremendous edge over their enemies. The performance, capacity and reliability of Informix-OnLine mainframe replacement software. With Informix database software running on virtually every UNIX® system, Napoleon was able to choose the most cost-effective hardware configuration for every location and application. Nothing but much larger and much more expensive systems had ever approached this solution in the past.

Strength of the Allied Army

USING EITHER WINGZ ON
GRAPHICAL PC'S, OR
SMARTWARE' ON DOS
MACHINES, NAPOLEON'S
STAFF COULD EASILY
ANALYZE DATA AND
PRODUCE REPORTS THAT
COMBINED TEXT, GRAPHS
AND DATA, ALL ON
ONE PAGE.

HISTORIANS NOTE THAT
NAPOLEON HIMSELF KNEW
LITTLE OF COMPUTERS.
BUT WITH WINGZ DATALINK,
THE INFORMIX-ONLINE
DATABASE BECAME AS EASY
TO USE AS A SPREADSHEET.

frame could. Its multimedia feature meant he could store data in virtually any form. Including reconnaissance photos. Three dimensional maps. Multi-colored charts. Even clandestine sound recordings collected by his intelligence network.

◆ ◆ ◆ ◆

WITHIN THREE MONTHS, THE FRENCH COMmander had amassed an army of 120,000 men, supported by 246 pieces of artillery. The opposition would be a far greater allied force comprised of British, Dutch, Belgian and Prussian troops, led by the Duke of Wellington.

But, while Wellington's staff struggled with traditional database systems that required experts and hours of work to generate reports, Napoleon's cadre had instant access to information through Wingz™ DataLink and INFORMIX-OnLine.

Historians acknowledge that this Executive Information System was perhaps the most formidable weapon in the French arsenal.

◆ ◆ ◆ ◆

ON THE EVENING OF JUNE 16th, NAPOLEON led his army across the Sambre River into Belgium, established headquarters at Beaumont and began his analysis.

As early reports came in, his strategic responses were transmitted to the field.

◆ ◆ ◆ ◆

AT ELEVEN O'CLOCK ON THE MORNING OF the 18th, Napoleon rose from a brief nap and

gave the order for his guns to blaze. What followed is now recognized as one of the most ferocious battles in military history.

Less than two hours into the fighting, more than 300,000 men were engaged in hand-to-hand combat on a battlefield that was just four miles square.

The key moment came just before dusk. Napoleon used Wingz with OnLine to run a simulation projecting Wellington's casualty rate and chose to deliver the coup de grâce.

The order went out to let loose five batallions of the elite Old Guard. Charging into the fray, they crushed what remained of the enemy's resolve.

Looking out over the victorious ranks, Napoleon Bonaparte raised a glass of his most precious cognac, turned to Marshall Ney, and uttered the now-famous words, "What a glorious day for France."

"QUEL JOUR GLORIEUX POUR LA FRANCE."

NETWORKING

DATA STREAM

Jeffrey Fritz

When a LAN is not a LAN

Lately, there has been talk about using Integrated Services Digital Network (ISDN) technology as a local-area network. While ISDN does support certain services that can be deployed in a LAN-like manner, ISDN cannot replace high-production networks using Ethernet or token-ring.

ISDN simply doesn't support the speeds or offer the degree of service that are found on most conventional LANs. However, there are times when ISDN can serve as a virtual LAN, delivering LAN-like services in a unique way.

One of ISDN's nicest features is its ability to support fast call setup. Compared with analog connection time, ISDN is lightning-fast. An end-to-end connection can be set up in less than 600 msec. ISDN can also connect to a wide variety of destinations at respectable speeds. Serial devices such as printers, modems and other personal computers can be connected to ISDN terminal adapters and shared by several users. This usually requires the user to place a data call to the desired device's destination number,

Unisys offers network support

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Laying claim to six years of experience building local-area networks, Unisys Corp. recently introduced Connect, a five-phase program to plan, design, install and maintain LANs.

Unisys will act as a single point of contact for LAN customers, maintaining its own equipment and software as well as that of other vendors.

Last October, Hewlett-Packard Co. introduced a comparable service called HP PC-LAN Support. Digital Equipment Corp. also has a LAN support offering.

"I think everyone should be in this business . . . if they want to stay in business. The opportunities today are in networking and LANs. They're complex, vital," said Don Goodspeed, vice-president at Westport, Conn.-based Meta Group, Inc.

Goodspeed was less sure of Unisys' ability to sell the service outside of its existing customer base, but he welcomed the thoroughness of the five-phase Unisys offering.

Maintenance and support contracts for its computer customers already account for about one-quarter of Unisys' revenue, said Unisys director of services market development Joseph Zeccardi, who estimated the market for value-added network planning and support services at $2 billion annually.

Unisys will initially support LANs using Novell, Inc.'s Netware, which it has been selling under the name Usernet since 1984.

By the end of the year, Unisys plans to have 160 certified network engineers dedicated to the LAN services organization. The company will eventually have 200 of these engineers, who will be supported by its existing staff of 4,000 to 5,000 customer service engineers, company officials said.

Pricing for Connect will depend on the particular contract. However, these prices will be "competitive" with what LAN manufacturers charge for such services — in the $100 to $200 per hour range, Zeccardi said.

Zeccardi noted, "In addition to planning, design and installation, we will also take full responsibility for hardware and software content." The Unisys Surety Service Program will offer various levels of maintenance and support for the LAN and all its attached devices. Also, as part of ongoing service, Unisys said it will periodically visit its LAN customers to check the performance of their networks.

FEATURE: CUSTOMER-CARRIER RELATIONS

Catching users in public nets

BY JOANIE M. WEXLER
CW STAFF
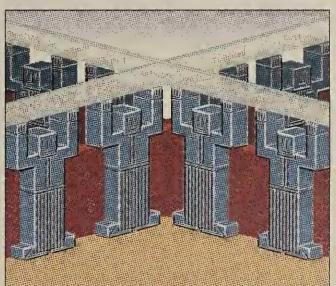
The postdivestiture dust has settled, leaving corporate telecommunications professionals confident in the expertise and survival of multiple communications carriers in a competitive world. In the aftermath, interexchange carriers have been able to woo many customers back to public networks with economical enhanced services once available only through private solutions.

Many large companies now consider their interexchange carriers strategic partners in planning and building corporate networks. Recognizing that carrier resumes are brimming with networking talent, users are easing up on their postdivestiture doggedness to handle every wire, jack and port in-house.

Notes Tom Pollando, corporate director of communications at Paine Webber, Inc., an AT&T Tariff 12 customer: "As a manager, I want the most talented people I can find running my network. It's the long-distance carriers who are at the leading edge in communications."

Carriers are becoming more flexible in accommodating individual company needs via volume discounts, custom-designed networks, virtual private networks and fractional T1. Also, software-defined network management services give users control over their networks previously offered only by private T1 switches.

"Economics are the main reason users migrate back to public networking," says Tom Nolle, president of CIMI Corp., a communica-

Scott Baldwin

Primary Access aims to pare down dial-up access

BY JOANIE M. WEXLER
CW STAFF

SAN DIEGO — A product that could replace the jumble of equipment in the asynchronous dial-up environment with one multifunction device was introduced last week by start-up Primary Access Corp.

Called Primary Access, the system integrates the function of modems, channel banks, packet assembler/disassemblers (PAD), channel service units, local-area network servers and Integrated Services Digital Network terminal adapters into a software-based, modular system containing T1, fractional T1 and other interfaces.

Control and management of the functions and interfaces are provided by a centralized personal computer-based system called Primary View.

"We're excited about this," said Tom Calabrese, assistant director in the telecommunications division at The Travelers Corp. insurance company in Hartford, Conn., which is planning to test the product. "We've been on the lookout for just such a system."

No nightmares

Calabrese said that The Travelers has so far avoided bringing its dial-up traffic onto its extensive T1 backbone network because of the "operational nightmare of the racks of modems and PADs" needed to do so.

Calabrese said, however, that the system will not be successful if it "introduces any new problems to the already-troublesome [error-prone] dial-up environment."

The vendor said cost savings will occur at reconfiguration and upgrading time when downloaded software can be used instead of discarding existing hardware. Cost of the system is $31,500 for a configuration with one T1 interface, 24 V.22 bis modems, Primary View, cabinetry and power supply.

"If you can eliminate a number of black boxes, more power to you," said George Newman, manager of communications at Technology Investment Strategies in Framingham, Mass.

He added that companies starting to build networks and those replacing modem banks over time in their data centers would be the most likely candidates for the product. Other targeted customers are enhanced services providers and local and long-distance carriers.

Newman noted that the all-in-one approach has historically been a difficult sell for vendors in that "a specialized device may be fine-tuned for what you need, where the integrated product might be more generic."

The vendor said it sees an $879 million market for the system, a sum of the market segments for the various devices it replaces. Primary Access began shipping last month.

Novell beefs up Mac ties

Novell, Inc. recently made three announcements, each intended to bolster the local-area network manufacturer's stake in the world of the Apple Computer, Inc. Macintosh.

The Provo, Utah-based company last month announced the release of LAN Workplace for Macintosh Version 1.1. The update offers new features for Macintosh owners using Novell Netware products.

Macintosh Workplace 1.1 includes 12 European alphabets, a larger screen display, Telnet terminal emulation and print-screen capability. The print-screen ability allows users to print portions of Telnet sessions with mouse functions. The software, which is priced at $250, includes support for File Transfer Protocol, Transmission Control Protocol/Internet Protocol (TCP/IP) software and network monitoring software.

Shiva gets Fastpath license

At the same time, Novell announced the licensing of Fastpath, its Macintosh gateway product, to Cambridge, Mass.-based Shiva Corp. Novell picked up greater Macintosh connectivity expertise from its merger with Excelan, Inc. in June 1989.

Shiva specializes in Macintosh networking software and hardware. Fastpath connects the Macintosh's Localtalk with Ethernet.

Fastpath supports protocols including Decnet and TCP/IP and allows sharing of printers, file servers and other peripherals as well as electronic mail.

Novell took another step in its campaign to create a higher profile in Japan. Novell has formed a Tokyo-based joint venture with Softbank Corp., a software/peripheral distributor.

The new company, called Novell K. K., was registered for business March 30. Novell, the major partner in the venture, is joined by Softbank, Canon, Inc., Fujitsu Ltd., NEC Corp., Sony Corp. and Toshiba Corp.

The company will market and support Japanese versions of Novell's Netware product line. Novell K. K. expects to deliver its first product, Netware 386, this fall.

Hubble reaches out to terra firma

BY GARY H. ANTHES
CW STAFF

GREENBELT, Md. — It was hard to tell if Paul Ondrus regretted scheduling an interview just two days after the launch of NASA's Hubble space telescope. But it was clear that the director of the missions operations support office at the Goddard Space Flight Center had other things on his mind.

The telescope's high-gain antenna would not lock onto the satellite needed to relay data to the ground, and Ondrus punctuated the meeting with anxious telephone calls and consultations with colleagues.

Nothing is simple about the $1.5 billion Hubble telescope, now stretching its wings some 380 miles above Earth — certainly not data communications.

Volumes are high; a megabit of imagery data will flow from the telescope every second, 24 hours a day for at least 15 years. Readings that show the status of the telescope's many complex instruments are sent from each of 6,000 sensors once per second. Scheduling data, which tells

the telescope where and when to look, must flow virtually error-free to the telescope through a tortuous terrestrial and celestial route.

Scheduling is almost unbelievably complex, Ondrus said. Each day, the telescope's instruments and controls act on 20,000 commands, which are relayed from Goddard. Timing is crucial in order to prevent the telescope from damaging itself and to avoid wasting precious viewing time. Scheduling algorithms use artificial intelligence and statistical techniques to balance hundreds of often conflicting factors.

Scientists wishing to conduct experiments must have their requests approved and in the schedule queue more than one year in advance, and space telescope glitches can require rerunning the scheduling programs for a period stretching back over three weeks.

"It's like an air traffic control system with a new flight schedule every day, and if one plane is late you have to reschedule all planes for three weeks," Ondrus said.

The schedules and other commands are relayed from Goddard to a NASA ground station in White Sands, N.M., via a domestic communications satellite. They are then relayed to one of two tracking and data-relay sat-

The Hubble *telescope relays data from 6,000 sensors every second*

ellites hovering in geosynchronous orbits at altitudes of 22,000 miles. The relay satellites, operating in S-band and K-band frequencies, then relay the data to the telescope.

Data coming back follows the same path in reverse. The telescope may send data in real time, or it may store it on tape if the relay satellite is temporarily out of view. Imagery data is sent in 4.8K-bit blocks that include address information and error-correction codes.

After various data clean-up and validation steps, the imagery data is transmitted using Digital Equipment Corp.'s Decnet over leased telephone lines to the

Space Telescope Science Institute in Baltimore, where it is further processed, calibrated and stored on tape and optical disc.

Data undergoes a sophisticated error-correction process, called Reed-Solomon, that uses multiple check bits for coding and decoding. An error should occur no more than once in every 10 million bits, or 100 times better than offered by conventional techniques, Ondrus said.

In addition to imagery data, Hubble sends back more than 500 million instrument readings daily. An expert system evaluates the real-time readings, looking for and even predicting problems. Problems are displayed graphically on workstations, keyed to pictures of the telescope and its components.

The expert system suggests corrective measures, and ground technicians respond by sending commands or parameter changes back to the telescope.

Ondrus's staff eventually discovered that a cable, slightly too long, had prevented the telescope's antenna from swiveling properly toward the relay satellite. A series of tricky computer commands went up, and everything worked — for the time being.

Public nets

tions market research firm in Haddonfield, N.J.

Cost efficiencies are easier to come by for large users in that "if you have a certain volume of traffic, the major carriers can all offer you a similar, attractive price," says Richard Bolenbaugh, a senior telecommunications analyst at *The Los Angeles Times*, which uses MCI Communications Corp.'s Vnet virtual network. "The real legacy of divestiture is service" — a high percentage of network uptime, clear transmission quality, quick resolution to network outages and keeping the user informed about network status, he says.

Nolle estimates that for companies with monthly telecommunications budgets under about $4,000, switching carriers for cost savings is not worth the effort if service quality suffers. "Users need to achieve savings of 15% to 20% to justify giving up any quality," he says.

The economics associated with volume discounts and custom networks — bundles of network services tailored to a company's individual needs — have made public networking attractive. Carriers now see a positive return on investment from designing a package of 800, WATS, switched 56K, T1/fractional T1, Integrated Services Digital Network (ISDN) and other services for customers. AT&T, for example, offers corporate custom networks under Tariff 12 contracts.

The reliability of digital lines combined with the economics of switched solutions such as virtual private networks and ISDN are another lure to the public network. Switched access can be less expensive than leased lines, depending on traffic volume, in that customers only pay for bandwidth when they use it.

Virtual networks allow customers to allocate a portion of the public network between their premises and the carrier's central office to a mix of services and destinations. AT&T provides this service under its Software-Defined Network offering, U.S. Sprint Communications Co. under its Virtual Private Network and MCI under Vnet.

Money savers

Virtual networks attempt to offer the channel allocation flexibility of a private network without forcing users to make large capital investments in their own equipment or in dedicated lines. Virtual networks allow users to reallocate bandwidth as traffic fluctuates during the day.

Dynamic bandwidth allocation for voice is offered in real time over AT&T's and Sprint's ISDN Primary Rate Interface lines on a call-by-call service selection basis. This service is not yet available on the data side because it is not cost-efficient for carriers to run fiber to customer-premises equipment (CPE), Nolle says, adding that the gigabytes of bandwidth provided by fiber would be needed for bandwidth-on-demand for such applications as video on a switched basis.

Synchronous Optical Network (Sonet), an emerging fiber transmission and interface standard that gives users access to individual chunks of fiber bandwidth, will be key in bringing fiber to CPE and reducing digital technology costs, Nolle says.

The rapid proliferation of fractional T1, which allows a user to lease 64K bit/sec. increments of a 1.5M bit/sec. T1 pipe, is also offering significant cost savings to those not needing full T1s. For example, per AT&T's November 1989 tariffs, a leased 64K bit/sec. increment from AT&T running from Washington, D.C., to San Francisco is $1,026 per month, compared with a monthly charge of $20,272 for a full T1.

With the new options available from carriers, some firms are focusing on business issues, not on being their own phone companies. Paine Webber, for one, is outsourcing much of its network operations to AT&T.

Largely because of their regulated status, local exchange carriers are two years behind the interexchange carriers in introducing enhanced services, says Steve A. Sazegari, an analyst at Dataquest, Inc. in San Jose, Calif. He says this motivates users — and long-haul carriers functioning as systems integrators — to seek bypass alternatives.

It is possible for users to collocate equipment, such as private T1 multiplexers, in the interexchange carrier's central office and bypass the local carrier. Some firms with large fractional T1 networks are finding this

cheaper than paying for the extra bandwidth of running full T1s from many dispersed sites to local central offices.

Joe Gallo, senior director of corporate telecommunications at Automated Data Processing, Inc., in Roseland, N.J., is collocating his T1 switches in Sprint's central office for his brokerage network. Gallo says he can reduce his access costs 50% by going straight to the interexchange central office.

The ability to reconfigure a network in real time, usage monitoring and automatic call routing were among highly rated network features in a recent survey

by Frost & Sullivan, Inc., a market research firm in New York.

MCI and AT&T have announced network management interfaces that allow users to key in a circuit number at a terminal and find out that a T1 line is down, locate an associated equipment failure and determine an expected "fix" time.

In addition, services such as AT&T's Customer Controlled Reconfiguration allow users to lease a portion of a central office digital cross-connect — which switches T1 lines in increments of 64K bit/sec. — and make changes to network configuration as if they had private nodes.

Contract counsel

One way for users to ensure that vendors provide them with what they need is to nail down a service contract. Users and analysts offered the following advice:

• Define procedures for escalation — the amount of time allowed for repairs at each level of expertise before passing the project up to the next highest level — and define essential circuits for priority maintenance.

• Specify diverse routing, uptime guarantees and quality of service.

• Know what equipment you will use and how it will mesh. "Get all your vendors and carriers together and draw up a schematic from one end of the network to another," advises June Hoffman, telecommunications supervisor at Kaiser Permanente, a health maintenance organization. Hoffman also says to negotiate price for T1 lines.

• Insist on a "favored nation" clause in your contract, which ensures that if the carrier offers a similar service to someone else for a lower price, you automatically get that price, advises Bill Rahe, president of the Aries Group-MPSG, a market research firm in Rockville, Md.

JOANIE M. WEXLER

Fritz

transfer the data, drop the call and connect to the next destination. Users can automate the process through the use of the script languages supplied with modern communications programs. However, writing and debugging scripts can be tricky for the casual user.

Fortunately, software vendors have provided ways of automating the process by integrating their software into ISDN's fabric. Easystreet, from Newbridge Networks, Inc. in Herndon, Va., and Manylink, from Manylink Corp. in Redmond, Wash., are specifically designed to support ISDN virtual networking. The software transparently handles device destination lookup, call setup, data transfer and call termination.

This gives users the impression that ISDN is a virtual local-area network able to connect to many destinations over great distances. Ken Wade, president of Manylink, said, "[Virtual LAN software] allows standard applications such as Wordperfect or Lotus' 1-2-3 to access devices on the ISDN network."

Once connected to ISDN, the software can use devices such as remote printers that are located far outside the normal range of LANs. In fact, the term LAN is actually a misnomer because the virtual network range is far enough to be considered a metropolitan-area network. According to Wade, "The goal [in developing virtual LAN software] was to implement shared data conferencing in a method similar to voice conferencing. For example, a joint editing project can be done on-line with existing software, allowing several users to work on a common spreadsheet."

Easystreet and Manylink are solid packages that are well-thought-out and highly integrated into an ISDN environment, although each has its advantages in comparison with the other. ISDN virtual LAN technology makes it possible for a home worker or remote user to access files from office computers. No coaxial or special cable needs to be run because ISDN uses the telephone company's standard wiring.

One drawback of ISDN virtual LANs is that file transfers are slower than those in most conventional LANs. Since virtual LAN packages typically use ISDN's D channel at 9.6K bit/sec. or B channel at 19.2K bit/sec., this is to be expected. One way around the problem is to use faster terminal adapters supporting asynchronous communications at 38.4K bit/sec.

Even if files don't get transmitted at full LAN speeds, some virtual LAN software packages can move the process into background mode, so the computer can do other applications while the file transfer is under way.

Is it overly optimistic to think that ISDN virtual LAN technology can become a major ISDN application? Probably not. Cost and a lack of unique applications are two of the biggest obstacles to widespread ISDN use. Clearly, virtual LAN connectivity offers users a unique application not readily supported by other data communications technology. Given its potential, ISDN virtual LAN technology may indeed play a major role in putting ISDN services on the map.

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va.

U.S. Sprint awarded weather system pact

The U.S. Department of Defense has awarded **U.S. Sprint Communications Co.** a five-year, $10 million contract to serve as systems integrator for the department's Automated Weather Distribution System program. Sprint said it will provide high-speed network services and equipment for providing real-time weather information and graphics to U.S. Air Force bases throughout the continental U.S. The carrier will also provide field maintenance and network operations staff for the program.

The Bank of Bermuda has licensed **Systems Strategies, Inc.'s** Ezbridge File Transfer/Mail software in order to permit financial reports to be electronically transferred between the bank's IBM System/38 and Digital Equipment Corp. VAX computers. It will also be used to deliver reports to customers who use the bank's accounting services to keep track of their funds, Systems Strategies said.

The Franklin Institute science museum in Philadelphia will be working with **Unisys Corp.** to design and implement an interactive information system for visitors. Called Unisystem, the system will consist of computer stations in various exhibit areas that will answer visitors' questions when a barcoded card is inserted. The system is scheduled to become operational in the museum's new Futures Center this month and in the Science Center in December.

SMOKE

IBM's RISC System/6000.

No graphics workstation under $12,900

No complete family available until end of 1990

No system over 41.1 Dhrystones MIPS

No commercial 4GL/DB software available across full line

No symmetric multiprocessing

No OSI support

No industry-standard RISC chip

No multivendor binary compatibility

No 19" color workstation under $16,300

No VME support

No commitment to system V.4 support

No broad performance range

vs. FIRE

Internet makes users KIS-ing cousins

Prototype retrieval system bridges disparate network directories

BY GARY H. ANTHES
CW STAFF

RESTON, Va. — A prototype system has been put in place that can transparently search Internet directories, retrieving electronic mail addresses and other information for users trying to locate other users.

Imagine a city with one million people and dozens of neighborhoods, each with its own telephone directory in a unique format. Now imagine you want to call a friend in this city, but you don't know the telephone number or address.

This sounds like a challenge, but it is the prospect that confronts users of Internet, the conglomeration of networks that links some 200,000 computer hosts and one million users. The 2,000 international, national, regional and local networks that make up Internet evolved more or less independently and are loosely coupled through gateways. There is no central directory, or so-called white pages service, to help users reach out and touch one another.

Some groups of Internet E-mail users — those on Milnet and Csnet, for example — are supported by directories, but thousands more are not listed in any readily accessible database. Querying the major directories is tricky, since each demands a different kind of query and returns information in a different format.

The new umbrella service, called the Knowbot Information Service (KIS), is being developed by the Corporation for National Research Initiatives (NRI), a nonprofit firm that specializes in data communications.

NRI coined the term Knowbot to refer to programs that can access network resources on behalf of their users. Knowbots visit multiple network sites and bring back useful information while remaining the agents of their respective users.

A KIS user enters the last name of the person sought. A Knowbot searches each of the major Internet directories, then returns the full names of all users with that last name. KIS also identifies each person's source, the E-mail address, telephone

Tom Monahan

number, mailing address, date of last update and possibly other information. The display format is consistent, regardless of the source. KIS users can limit the information returned and the places searched by qualifying their queries in various ways.

"KIS is having someone willing to sit at your desk and thumb through a whole bunch of telephone books," said Marshall Rose, principal scientist at Reston, Va.-based Performance Systems International, Inc. Rose heads a pilot project to evaluate the feasibility of the CCITT X.500 standard for directory services for use on Internet.

At present, KIS searches seven major Internet directories. The oldest is at the Network Information Center at SRI International that holds more than 50,000 user entries, most for Milnet users. The largest, with more than 110,000 mailbox addresses, is part of MCI Communications Corp.'s E-mail service. About 400,000 users are now

available to KIS, and more white pages services will be added, said Vinton Cerf, a vice-president at NRI.

By default, KIS will not look at the local "finger" services of University of California at Berkeley Unix Version 4.3 systems because there are far too many of them, but a KIS user can specify one or more of these local user-account databases to be queried.

KIS is accessed through a local client Knowbot that is run as a user program. The client Knowbot communicates with a server Knowbot through a Transmission Control Protocol/Internet Protocol port. The server Knowbot fields incoming queries and issues requests to the remote directory services. The responses are formatted by the server Knowbot and returned to the client Knowbot.

KIS can be used interactively by those who have Internet accounts or via E-mail by those who do not. Mixed modes allow a user to make a query interactively, with the results returned by E-mail.

KIS is operational, but it is likely to have bugs and be somewhat cumbersome to use, Cerf said. The user interface Knowbot now uses is a crude "dumb terminal" display, but NRI plans to add an X Window System interface with user-friendly menus of options, he said.

X.500 is an approved standard, but it will be years before it is in widespread use on the Internet, Rose said. He said Performance Systems' goal is to have interactive, distributed X.500 service covering 90% of Internet users in place within seven years.

Even with X.500 implementation, KIS will still be useful because its Knowbots can be trained to accept X.500 queries, access non-X.500 databases and return results in X.500 format, Cerf said.

In any case, neither KIS nor X.500 will solve the biggest problem facing directory services — how to keep them complete and correct. Fewer than half of Internet users are listed in a directory, and many entries are hopelessly out of date, Cerf said.

Sun announces ship dates for set of ONC enhancements

BY ELISABETH HORWITT
CW STAFF

MOUNTAIN VIEW, Calif. — Two weeks before the Open Software Foundation is expected to choose the Decorum system as its official distributed computing standard, Sun Microsystems, Inc. announced a two-year strategy for making its own rival platform, Open Network Computing (ONC), the "true" standard.

Sun announced year-end shipments for previously announced ONC enhancements that are designed to extend the platform's networking support beyond Transmission Control Protocol/Internet Protocol.

First, ONC will support the Transport Layer Interface component of AT&T Unix System V Release 3, which is said to allow applications to communicate transparently across a variety of networking protocols including, in the future, Open Systems Interconnect.

Second, ONC will support Netwise, Inc.'s remote procedure call compiler, RPC Tool, which is said to facilitate the porting of distributed applications across various network and computer operating systems. Novell, Inc., 3Com Corp. and Banyan, Inc. have all said that they will support ONC on their networking systems via Netwise's compiler.

Sun also said it plans to enhance its Network File System (NFS). In the performance area, the vendor introduced an asyn-

chronous version of the NFS that is said to eliminate the need for a system to suspend all tasks while it waits for the completion of the task it has initiated on another system. The enhancement will ship by year's end, according to Sun.

The company said that it will incorporate utilities for "streamlining NFS requests" as well as local disk caching to reduce network traffic.

Sun announced that by the first half of next year, NFS will support Kerberos, a security system developed by MIT's Project Athena. NFS will continue to support Sun's Secure product, the vendor said.

Object orientation

In addition, Sun said it will enhance its naming services to be object-oriented "so that users can browse through network resources" asking, for example, for a "class of information such as 'Tell me about all corporate network gateways,'" said Geoffrey Baehr, the company's vice-president of distributed systems.

Sun announced that it will also provide a gateway that will allow its naming services to interoperate with systems that support CCITT X.500, although the vendor has announced no plans to actually migrate its naming services to the directory standard.

Neither of the above announcements will be released until "1992 and beyond," Sun said.

NEW PRODUCTS

Local-area networking software

Phaser Systems has announced support for the IBM ES/9370 Models 10, 12 and 14 computer system with Netware for VM, the company's version of Novell, Inc.'s local-area network operating system.

Netware for VM for the ES/9370 allows personal computer/LAN users to establish Netware disk volumes on mainframes, transfer data and applications between Netware LANs and IBM mainframes and link to other remote LAN systems via a Systems Network Architecture internetwork bridge, the vendor said. A version of Netware for VM that uses the Token-Ring communications adapter of the ES/9370 is available now.

Pricing ranges from $20,000 to $75,000, depending on type of mainframe used.
Phaser Systems
Suite 650
One Market Plaza
Spear St. Tower
San Francisco, Calif. 94105
415-495-6300

Customer-premises equipment

Gandalf Data, Inc.'s TA-1 Basic

Rate Interface terminal adapter allows network managers to use existing equipment to access Integrated Services Digital Network (ISDN) facilities.

The product facilitates multiplexer, front-end processor, cluster controller and local-area network bridge and gateway transport applications by allowing them to run over high-bandwidth ISDN facilities. The adapter converts data to and from ISDN-compatible streams and accepts synchronous data at up to 56K bit/sec. or 64K bit/sec.

The product costs $1,095.
Gandalf Data
1020 S. Noel Ave.
Wheeling, Ill. 60090
708-459-9348

Gandalf Data's *Basic Rate Interface terminal adapter allows applications to run over high-bandwidth ISDN facilities*
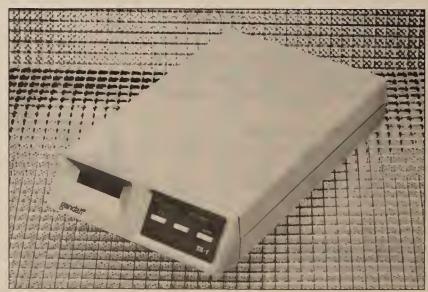
Protocol converters

General Datacomm, Inc. has introduced a miniature converter designed to provide the interface between asynchronous terminals and synchronous data communications devices.

The GDC ASC-3 can convert at speeds up to 19.2K bit/sec. It operates in point-to-point or multipoint network applications, and users can choose asynchronous data rates from 600M bytes to 19.2K bytes.

The product is scheduled to be available next month for $245.
GDC
Route 63
Middlebury, Conn. 06762
203-574-1118

Technically, It's An Architecture.

But It's Really Something Else.

Freedom.

Freedom to choose.

Freedom to change.

Freedom to grow.
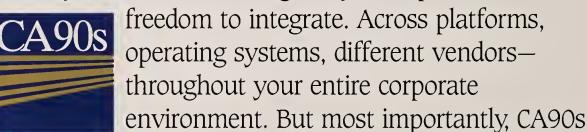
The basic tenets underlying the most advanced, and independent architecture ever developed.

CA90s from Computer Associates.

Since it comes from the world's leading, independent software company, CA90s can liberate you from hardware constraints.

At last, you're free to choose the best applications and deliver more efficient distributed processing.

Since it encompasses SAA, NAS and the other industry standards, CA90s gives you unprecedented **CA90s** freedom to integrate. Across platforms, operating systems, different vendors— throughout your entire corporate environment. But most importantly, CA90s gives you the freedom to grow. It continually protects your MIS investment by always providing ways to integrate new technology with your existing technology.

Altogether, CA90s is the architecture that offers you the freedom to face tomorrow.

And it's ready just when you need it the most. Today.

Today.
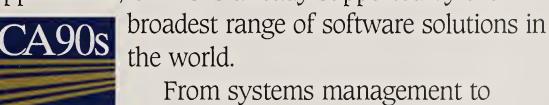
Not next year.

Next month.

Next week.

CA90s is here today.

Unlike other architectures that patiently await applications, CA90s is already supported by the broadest range of software solutions in the world.

CA90s

From systems management to information management to business applications, there are literally hundreds of applications that deliver the benefits of CA90s.

But that's only the beginning.

The real magic is in how these applications work together.
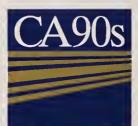
By sharing common services and advanced technology, CA software brings you the highest levels of integration and automation in the world.

Starting today, in every aspect, CA90s will change the way you look at your MIS world.

And Tomorrow.

The world of high technology moves very fast.

CA90s And around every bend is a fork in the road. Right or left. Yes or no. It seems your options are always limited. And if you make the wrong choice, you could be left behind.

But, it doesn't have to be that way.

CA90s can change your entire approach to future technological breakthroughs. It's designed specifically to accommodate rapid change while at the same time protecting your investment. So you can have the best of both worlds.

It accomplishes this in two ways.

The first is forward-looking. CA90s shared-services approach gives you the freedom to change because new technology can be quickly and easily implemented and integrated.

Looking backward is just as important. Recognizing the enormous investment you've made in your existing technology, CA90s always provides responsible, efficient ways to migrate to new technology. The net result is you can approach the future with confidence.

No matter what you face, you'll always be free to make the right decision.

Free to grow.

Free to choose your own road.

COMPUTER® ASSOCIATES
Software superior by design.

Taking the 'place' out of workplace

Telecommuting technology is expanding out-of-office work, and IS is at the forefront

BY J. A. SAVAGE
CW STAFF

On the volatile management issue of telecommuting, information systems managers appear to be far ahead of their peers in other departments.

During the last few years, the technology infrastructure has grown to accommodate work done from places other than the office. While IS employees are rarely discouraged from coming into a central office, the change in infrastructure is allowing managers to get productive work from them even when they are not in the office.

"The work that people do in IS lends itself to telecommuting," said Paul Blake, staff manager for Pacific Bell's customer IS in San Ramon, Calif. "If you're a programmer or a maintenance type, you're sitting by yourself with your tube and your manuals. The biggest problem is interruptions, and when you're telecommuting, you don't have those interruptions."

With computer rooms in 24-hour operation, it is not unusual to have companies provide each IS staffer with a home computer for remote diagnostics, as does Ask Computer Systems, Inc. in Mountain View, Calif. Beepers are also an integral technology that allows employees to work remotely, yet always be in touch.

The definition of telecommuting is gaining breadth to include the use of beepers and other products, according to Paul Saffo, a research fellow at the Institute for the Future, a Menlo Park, Calif., think tank. It was formerly understood to simply mean a way for an employee to work at home using a personal computer.

Saffo said that in the 1990s, the creeping technical infrastructure, such as facsimile machines in hotels, phones on airplanes, cellular phones, electronic mail and voice mail, will allow work to be done in places other than the office. American Airlines, for example, recently announced an "office in the air" on international flights (see story page 69). This would still be considered telecommuting, even though work is not necessarily being done at home. Software applications, such as groupware, which allow employees to work separately on the same project, and small, powerful computers to run such software are also becoming a more common means of telecommuting.

Saffo said that taking advantage of these products will give companies more flexibility and a cost advantage. One such advantage would be locating a company or a department in a nonmetropolitan area where the cost of doing business is cheaper.

For instance, a software development center could be in Boise, Idaho,

Michael Klein

EXECUTIVE TRACK

Ewing L. Lusk has been promoted to scientific director of the Advanced Computing Research Facility (ACRF) at the U.S. Department of Energy's **Argonne National Laboratory** in Argonne, Ill.

Lusk was previously deputy scientific director of the ACRF. Before joining Argonne in 1982, he was a professor of computer science at Northern Illinois University. He holds a bachelor's degree in mathematics from Notre Dame University and a Ph.D. in mathematics from the University of Maryland.

....

James W. Rackley has been named president and chief executive officer of **Trident Infotech (USA), Inc.**, the newly formed data processing subsidiary of Neptune Orient Lines in Oakland, Calif.

Trident Infotech is responsible for information systems and communications services for Neptune and its North American agent, Tricom Shipping Agencies, Inc. Trident Infotech also offers outside customer services, including transportation software, software development and outsourcing.

Rackley was most recently general manager of Trident Infotech PTE Ltd. in Singapore. He also spent five years in senior IS management positions at Neptune in Singapore. His 10 years in IS management prior to that included jobs at Sea Land Services, Energy Transportation Corp. and Delta Steamship Lines.

....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Shore leave for better systems design

BY JIM NASH
CW STAFF

In two Chevron Corp. subsidiaries, users of information systems services have a new tool for working with programmers on projects: face-to-face discussion.

The San Francisco-based petroleum giant has deep-sixed several corporate policies, said Bardin Nelson, senior systems analyst at Chevron Information Technology Co. (CITC), for the sake of a pilot project that brings programmers and users — including tanker crews — together in close quarters.

"We are attempting to make information sharing as painless and efficient as possible through a coordinated group effort," Nelson explained. CITC and Chevron Shipping Co. are developing standardized shoreside and ship-board software and a worldwide network linking Chevron with its approximately 40 tankers.

In 1989, Nelson and his 10-person team moved from their CITC offices in San Ramon, Calif., to the San Francisco high rise that also houses Chevron Shipping. Chevron also began rotating two fleet officers at a time to duty on the project. He said the group will stay indefinitely to develop and refine the resulting software and hardware.

"Our group exclusively supports Chevron Shipping," Nelson said. "Normally, [CITC] groups are project-oriented. Here, we've bundled together [shoreside and shipboard] applications development, which is a departure from our insulated approach in the past."

Chevron Shipping's Geoff Landon said that the approach has been well received. This way, he said, they have much more control over project direction and ingredients. Landon said particular attention has been paid to fleet officers, who put in five months — the length of an average voyage — working with Nelson's team.

"Our officers are the single most untapped source of productivity and quality improvement at Chevron," Landon said. "We fit the needs of the ship first and secondarily the needs of the home office."

Officers are picked for the project, Landon said, based on their professional expertise and ability to clearly see what Chevron wants to accomplish with the project.

Despite not targeting technophiles, there has been little resistance on the part of officers.

"The officers do it all while they are here, from needs-listing to flow-charting," Nelson said. "They go back to their regular duties as disciples and preach where we can't reach."

Chevron

People: Toughest part of partnerships

BY ALAN J. RYAN
CW STAFF

TORONTO — Marrying technology to the business was a hot topic in the late 1980s. Now, as companies move into the 1990s, the partners formed by that bond will be finding themselves held accountable for their company's bottom line.

So said speakers at the recent "Partnership Conference," sponsored by LOMA, an international association for the insurance and financial services industry.

"Business is not separable from technology any more," said Mike Tine, senior vice-president in the financial services department at The Travelers Corp. in Hartford, Conn.

Larry Bacon, senior vice-president of The Travelers' information systems department, agreed. For 20 years, Bacon said, technology was applied to the business when the business people requested it. "Neither group understood each other," and the process of building systems could take up to two years, he said. When systems were created, they often simply automated a formerly paper-based function, he said.

However, increased competition, the tremendous costs associated with long systems development and the changing markets of the insurance industry have brought about changes, Bacon said. Foremost are the partnerships between the businesses within The Travelers and the systems department.

"The partnership brings product design and systems people together at the beginning" of a project, Bacon said, and systems workers "are aligned to that line of business every step of the way." The partners are driven by business results rather than by business or technical considerations alone, he said.

The partnership can only work if there is a clear vision and capable people behind it, Tine said. "The technology is the easy part here."

When The Travelers' financial services department was looking at ways to improve its success in the annuity market, a task force of the best workers in that area and in the systems area was handpicked by Tine and Bacon and asked what could be done. The group formed service principles: quality, error-free processing that would provide good customer service and have easy access for customers.

The people conducting the study did not talk about the technology; they simply came up with a fix to a problem and then worked with the systems people to find the most effective system to meet that need, Tine said.

Working together, the team came up with the idea of having a skilled customer service representative who could be reached by customers via a toll-free phone number, facsimile or mail, Bacon said. The representatives would have all the information a client might request at their fingertips. "The service rep can take care of new business, billing and collecting, research and support, customer reporting and shareholder accounting," among other things, Bacon said.

The project was highly involved and expensive, but Tine said he believes the money was well-spent. It involved "several dozen people and cost several millions of dollars," he said. The project as it was originally planned would have taken up to two years to complete. "We didn't have the time," Tine said.

The decision was made to implement 70% to 80% of the functionality quickly. The other 20% to 30% may never be completed, or it may be modified pending the outcome of the initial phase, Tine and Bacon said.

Looking for CLUES

A similar partnership at The Mutual Life Insurance Co. of New York (MONY) helped form CLUES, its Comprehensive Life Underwriting Expert System, which has been integrated with the company's administrative new business processing systems.

CLUES applies 800 rules to applications for life insurance and then goes through 7,000 steps to determine if the case should be accepted, rejected or if an underwriter should check it to add more information, according to William Daly, retired vice-president of selection who now does consulting at MONY.

The CLUES partnership began with one person in the company's corporate IS area looking at expert systems in 1985 and the subsequent discovery that the underwriting department was doing its own expert systems research. In 1986, the two areas began working together as a team, according to Arthur Szu-tu, assistant vice-president of corporate IS.

In its first month of operation, CLUES processed 285 cases and had a 7% approval rate. By June 1987, the approval rate had climbed to 15%. Currently, the system has a 33% automatic approval rate of all cases, and it handles 75% of all new underwritten business, according to Szu-tu.

Telecommuting

where the cost of living is a fraction of that in major metropolitan centers. As long as there are good telecommunications links to headquarters, development could be done remotely.

These telecommunications links, which allow remote work, are another part of the infrastructure that has been in place only since the late 1980s. Idaho, for instance, had party lines that precluded the use of advanced telecommunications in "virtually every exchange in the state" until 1987, according to Perry Swisher, an Idaho public utilities commissioner.

Swisher claimed that the support of telecommunications has allowed businesses to locate in Idaho's small towns, where employees are able to enjoy skiing and the state's white-water rivers.

In the late 1980s, the advent of voice mail and E-mail made remote work more efficient. Both allow more detailed communications without the presence of both parties, and neither depends on the locale of the office or the employee.

"Voice mail and E-mail have really begun to lay the groundwork," said Gil Gordon of Gil Gordon Associates in Monmouth Junction, N.J.

Gordon, who has been preaching telecommuting for years, said he thinks software and changing organizational structures will be a boon for telecommuting.

Now, Gordon said, employees are relying on voice mail and E-mail even when they are in the same building. It makes little difference where employees are physically located.

The major stumbling block to telecommuting in the non-IS part of companies tends to be managers. Management is reluctant — to put it mildly — to have employees who cannot be observed, according to Saffo and Gordon.

IS managers, however, are more accustomed to the round-the-clock demands of systems and, as such, are obliged to allow employees to work sometimes without supervision.

"Managers need to get out of the mind-set that people are working because they can see them," Blake said. He did suggest, however, that managers have to be more organized to allow for a remote staff.

"You have to get all the administrative chores, like forms to fill out and meetings, all on the day that employee is in the office, rather than when [the manager] runs across or remembers the task," he said.

All the proponents of telecommuting agreed that managers have one more important task to make telecommuting work: They must devise their own methods to measure productivity other than in office hours.

In the larger scheme, Saffo said he thinks that all the technology in the world won't make corporations embrace telecommuting. "Technology enables, not drives," he said.

"We spent the last 40 years getting workers to their jobs. Now we have to think how to get jobs to workers. The change takes longer than expected," he said. He noted that personal computers have only been around for 10 years while

Coffee, tea or fax?

Telecommuting from airplanes will soon be possible on American Airlines international flights. The company will offer not only those expensive — but convenient — in-flight phones but also facsimile machine service.

Those products, coupled with a portable computer, are about all it takes for telecommuting eight miles high, although the stewards and stewardesses have yet to take dictation. The airline has not set a date to introduce air fax, but it expects to have a plan within the next few months, according to a spokesman.

"Office in the air" capability will first be available on the "International Flagship Service," announced late last month. In its first iteration, the fax machine will be absent, but business-class travelers will have videocassette recorders.

"We don't know to what extent we will offer this to economy seats," the spokesman said.

the basic concepts of society — such as going to work in an office — have been around much longer.

Saffo said he still expects telecommuting to take off: "The surprise will come when companies realize they have the infrastructure together and all they have to do is add software."

Loss of the personal touch

Those who telecommute swear that their productivity increases. Jay Fenton, a principal engineer at Farallon Computing, Inc., in Emeryville, Calif., said his productivity increased "drastically" after he began coming into the office only once per week instead of every other day.

Fenton, whose two home computers, fax machine and modem are supplied by Farallon, is high up enough in management that he is allowed to measure his own productivity. But his position is about to put him in the same boat with managers who want to see their employees.

"I'm just about to hire people to work for me," he said, adding that in his last job, he and his boss videoconferenced to communicate. "We started with a certain rapport, but the personalities turned into raggedy electronic images" and the working relationship fell apart, he said.
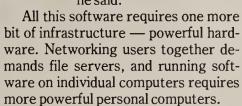
Fenton is about to hire someone who will come to his house for meetings. "I'm not convinced if you have to

Jay Fenton

supervise people you can do it just by talking [remotely]," he said.

Fenton is also a moderate user of groupware. Instead of electronic mail, which handles one-to-one communications, groupware handles group-to-group communications. Groupware for programming projects, however, is more tricky than that for text and graphics.

Fenton suggested that programmers be face-to-face when finishing a program. "If you have to get together to change part of the program, you have to gesticulate a lot in order to reconcile the differences," he said.

All this software requires one more bit of infrastructure — powerful hardware. Networking users together demands file servers, and running software on individual computers requires more powerful personal computers.

Fenton said another needed technology is Integrated Services Digital Network cabling into houses. The current transmission rate, 9.6K bit/sec., is not productive enough, he said.

J.A. SAVAGE

AND THE WALLS CAME TUMBLIN' DOWN.

These days the walls are coming down all over. We're moving toward a more open world. And so is business. That's why your hardware and software solutions have to be more flexible than ever.

Unisys can help. We have systems that are designed to fit almost any operating environment. You'll get optimal applications that eliminate old computing barriers.

We're dedicated to opening the computer environment and doing what it takes to give you the freedom you need to compete today.

Our mainframes can give you the application portability, integration and compatibility you need by meeting computing standards like POSIX, OSI, TCP/IP and by connecting with SNA.

And when it comes to UNIX® technology, no one can match our product breadth and software depth from micro to mainframe.
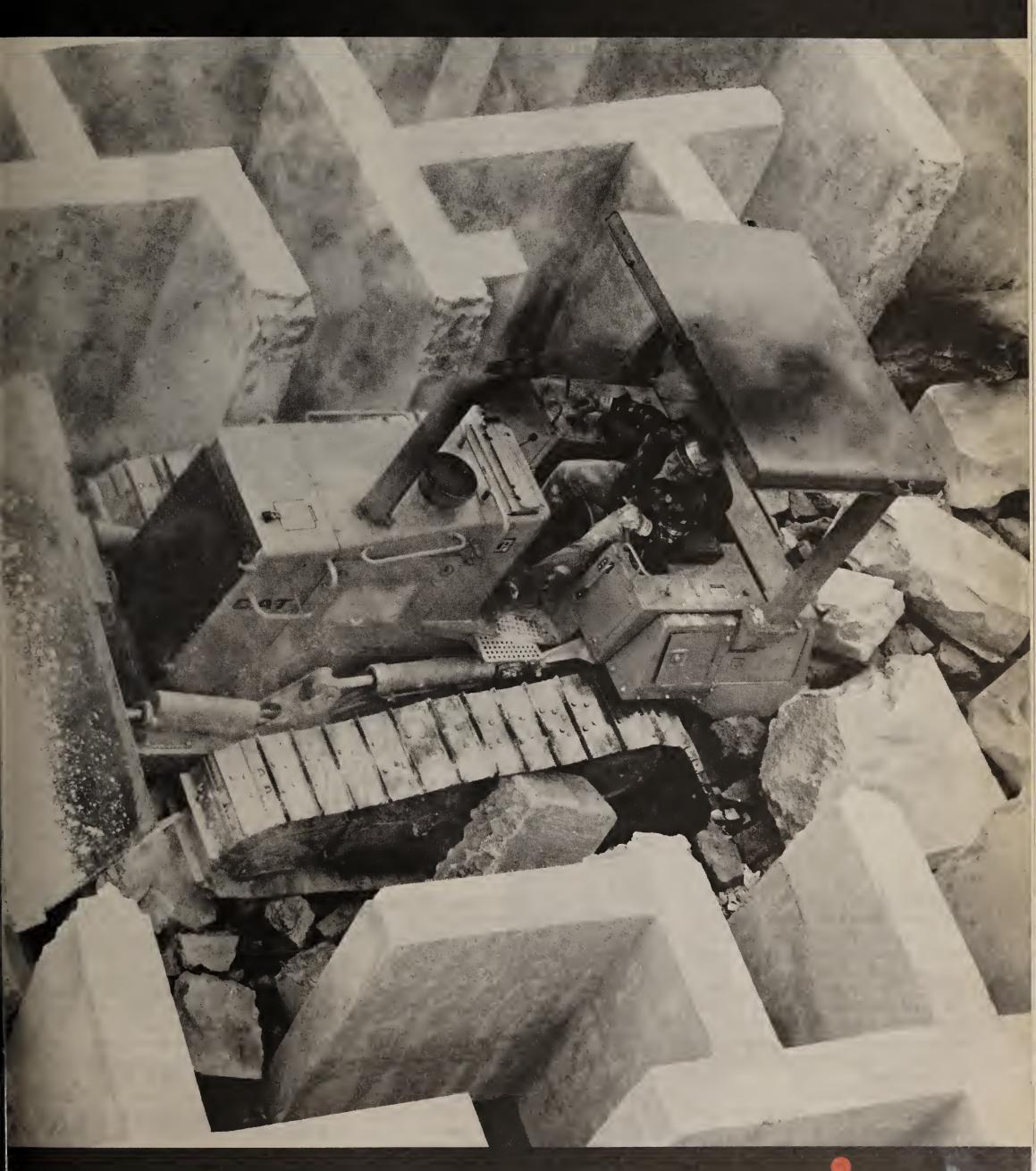
We'll be offering you UNIX On Line Transaction Processing (OLTP) as well. It matches the sophistication and speed of commercial on-line transaction processing with the complete flexibility of open systems.

We'll assist you in determining what systems you need, help you design, customize and install them. And we'll do whatever has to be done to keep it working efficiently and profitably.

Just call us at 1-800-448-1424, ext. 31. We'd like to knock down some walls for you.

Which computer is the most powerful?

Okay, so it's a trick question. But the right answer could be worth millions to you and your organization.

The average computer company would have you believe that you can measure power purely in machine terms. Like megahertz or MIPS.

But how many megahertz does it take to get twice as much work out of half as many people? Or get a roomful of sophomores excited about economics? Or let a harried executive quickly transform half-a-million spreadsheet cells into a presentation that will bring 500 sales reps to their feet in wild applause?

The truth is, conventional ways of measuring a computer's power don't have very much to do with the power a computer gives you to accomplish anything.

A personal computer can't do anything by itself. And a computer that people can't — or won't — use doesn't really have any power at all.

So don't judge Macintosh personal computers on the basis of hardware alone. (Although Macintosh can match up chip for chip, microprocessor for microprocessor, to any personal computer in the world.)

And don't judge Macintosh on the basis of software alone. (Although Macintosh lets you run more programs than any other personal computer in the world.)

Instead, judge Macintosh on the basis of what people and Macintosh achieve when you bring them together.

While all too many PCs spend most of their time doing nothing, like the computer on the left, you'll almost always find Macintosh computers like the one on the right. With human beings attached. Hour after hour. Day after day. Helping them do almost everything.

A recent survey of people who use Macintosh personal computer systems and people who use the other leading personal computer system in *Fortune 1000* cor-

porations helps explain why: Macintosh was rated 22% higher for user enjoyment. Which, in turn, helps account for why information systems managers in those companies rated Macintosh 22% higher for overall satisfaction and a remarkable 42% higher for user productivity.

So before you spend another dime on personal computers, invest a few minutes in a system that lets you measure its power by the only benchmark that really matters: the performance of the people who use it.

For the location of your nearest authorized Apple reseller, please call 1-800-538-9696, ext. 800.

Then you'll know why Macintosh is the most powerful personal computer you can buy today. The computer people actually use.

The power to be your best.™

C A L E N D A R

"Global Communications: Worldwide Connectivity Strategies," is the theme of a June 14-15 conference for companies that have, or are planning, an international presence.

The conference, to be held in Washington, D.C., will address the issues of technical and regulatory trends, including deregulation, demonopolization and privatization, and how those changes affect the networking alternatives available to multinational corporations for their global communications needs.

Featured speakers will include Gene Donlan of Fujitsu America, Inc., Robert Seifert of State Street Bank, Stanley Welland of General Electric Co., William Caton of Smith Kline Beecham, Charles Russell of Dow Jones & Co. and Robert Lantto of Cargill, Inc.

For more information, contact Infoline, Inc. in New York at (212) 557-3400.

MAY 20-26

Lap and Palmtop '90. New York, May 21-22 — Contact: Laptop Expositions, New York, N.Y. (212) 682-7968.

Increasing IS Productivity. Cambridge, Mass., May 21-23 — Contact: Jay Delaune, Index Group, Cambridge, Mass. (617) 499-1373.

TCP/IP & OSI. Washington, D.C., May 21-23 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

Xhibition '90. San Jose, Calif., May 21-24 — Contact: Sarah Lummas, Integrated Computer Solutions, Cambridge, Mass. (617) 547-0510.

Unix System Seminars. Boston, May 21-25 — Contact: Padcom Associates, Orange, N.J. (201) 678-7323.

AD/Cycle Conference. Chicago, May 22-24 — Contact: Case Research, Inc., Bellevue, Wash. (206) 453-9900.

CASE Tool Laboratory Symposium. Grand Rapids, Mich., May 22-24 — Contact: Dr. Paul Jorgensen, Research and Technology Institute of West Michigan, Grand Rapids, Mich. (616) 771-6800.

Executive Uniforum Symposium. Santa Barbara, Calif., May 22-24 — Contact: Patricia Seybold's Office Computing Group, Boston, Mass. (617) 742-5200.

Retail Systems '90. Dallas, May 22-24 — Contact: Conference Director, Retail Systems, Newton, Mass. (617) 527-4626.

Semicon/West '90 Show. San Mateo, Calif., May 22-24 — Contact: Advantest, Lincolnshire, Ill. (312) 634-2552.

Electronic Marketing & Retail Conference. Orlando, Fla., May 23-25 — Contact: Deloitte & Touche, San Francisco, Calif. (415) 296-2000.

IBM Token-Ring and SNA. San Francisco, May 23-25 — Contact: Kaptronix, Haworth, N.J. (201) 769-4250.

International Conference on Project Management, Planning and Estimation. Buena Vista, Fla., May 23-25 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Online. San Francisco, May 23-26 — Contact: Nan Hanahue, Allentown, Pa. (215) 821-7777.

Data Administration in the 1990s. Chicago, May 23-25 — Contact: Performance Development Corp., Princeton, N.J. (609) 921-3770.

MAY 27-JUNE 3

Advanced Security and Identification Technology Conference and Exhibition. Washington, D.C., May 29-June 1 — Contact: Paul Oyer, The Information Exchange, Woodbridge, Va. (800) 223-8128.

Empowering America's Industrial Competitiveness Conference. Fairfax, Va., May 29-June 1 — Contact: The National Coalition for Advanced Manufacturing, Fairfax, Va. (703) 323-2198.

International Smart Card Applications and Technologies Conference. Washington, D.C., May 29-June 1 — Contact: The Information Exchange, Woodbridge, Va. (703) 490-8615.

Federal Information Systems Conference. Alexandria, Va., May 30 — Contact: John D. Geron, EIA, Washington, D.C. (202) 457-4944.

Unique Telecommunications Symposium (UTS '90). New York, May 30-31 — Contact: UTS '90, Kings Park, N.Y. (800) 438-1242, ext. 535.

International Trade and Computerization Conference. New York, May 30-June 1 — Contact: NCITD, New York, N.Y. (212) 925-1400.

Personal Computers and Workstations Conference. Washington, D.C., May 30-June 1 — Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

1990 International Summer Consumer Electronics Show. Chicago, June 2-5 — Contact: Consumer Electronics Shows, Washington, D.C. (202) 457-8700.

Comdex/Spring '90. Atlanta, June 3-6 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

World Industry Congress VII. Washington, D.C., June 3-6 — Contact: Education Department at Adapso, Arlington, Va. (703) 284-5355.

JUNE 4-10

Networking PCs. Boston, June 4-5 — Contact: Andrea Shear, Boston University, Boston, Mass. (617) 570-8066.

1990 Information Management Conference. Toronto, June 4-6 — Contact: John Hobbs, Toronto, Ont., Canada. (416) 738-2337.

ISDN '90 Conference and Exposition. Denver, June 4-8 — Contact: Information Gatekeepers, Boston, Mass. (617) 232-3111.

MIS Training Week. Arlington Heights, Ill., June 4-8 — Contact: Phyllis Drum, Framingham, Mass. (508) 879-7999.

Costing and Chargeback Workshop. Long Beach, Calif., June 6-8 — Contact: The Institute for Computer Capacity Management, Milpitas, Calif. (408) 954-0114.

Midwest Wang Users Conference. Chicago, June 6-8 — Contact: United States Society of Wang Users, Chicago, Ill. (708) 652-3888.

Outsourcing of Information Systems. Reston, Va., June 7-8 — Contact: Input, Mountain View, Calif. (415) 961-3300.

Executive Symposium on Automated Mapping/Facilities Management/Geographic Information Systems. Keystone, Colo., June 8-11 — Contact: AM FM International, Englewood, Colo. (303) 779-8320.

Journal of Information Systems Management
Spring 1990

"An MIS Manager's Guide to Hiring Programmers"
By Janet Ruhl

■ By rethinking the search and hire process and knowing how in-house human resources operates, managers can hire talented and happy programmers — and wallop fair chunks of time and dollars from recruiting budgets.

First, realize that HR personnel are rarely savvy in the field of programming. Instead of citing minimum requirements such as expertise in a specific program-ming language or mastery of a mainframe database, think in broad terms of the aptitudes and personality traits that would make a candidate successful.

Second, do not demand a specific level of education. Requiring a four-year degree in computer science will knock out a large percentage of able candidates who may have attended college before computer science was an available major.

Next, do not exaggerate the importance or benefits of the position to lure applicants. If someone accepts a position believing it to be more managerial or more varied than it really is, you will have an unhappy new hire on staff who will have no qualms about leaving the company at the first opportunity.

Finally, interview applicants yourself.

Human resources representatives will frequently eliminate candidates because they are unsure of their suitability or confused by their acronym-filled resumes.

University of Minnesota Management Information Systems Research Center
Working Paper 1989

"The Economics of Data Integration"
By Dale Goodhue

■ The corporate challenge of determining an appropriate level of data integration is balancing effective communications with the least possible cost. Most companies will find it more desirable to partially integrate their data islands rather than to go to the extreme of total integration or total lack of integration.

A major cost of integration crops up in trying to agree on a single network design. Other costs are associated with loss of local autonomy and flexibility, translating nonintegrated data into a compatible form and the extra managerial time spent making decisions with nonintegrated or partially integrated data.

Data integration benefits include facilitating corporatewide actions and making information available for company-wide decisions.

The optimal degree of integration will vary with the number and diversity of subunits in a company, extent of centralization and emphasis on corporatewide vs. local-level activities and decisions.

California Management Review
Winter 1990

"Beyond the Charismatic Leader: Leadership and Organizational Change"
By David A. Nadler and Michael L. Tushman

■ A charismatic executive is not enough to steer a firm through large-scale organizational changes. While an inspired individual is critical to provide vision, direction and energy, different changes call for different types of leadership.

One of the most challenging changes to manage is reorientation, a strategic change for future competitive advantage. An individual executive is severely limited by his own time, energy and expertise to deal with the demands of such change. Two other forms of leadership are key in successful reorientations.

Instrumental leadership focuses on defining the behavior needed to achieve change and ensuring that employees continue that behavior. It consists of three elements: building competent management teams to communicate the desired behavior; creating processes to assess behavior; and establishing systems to reward or punish behavior consistent or inconsistent with the goal.

Institutionalized leadership entails expanding the number of people who perform leadership functions. This concept consists of three elements as well: developing an effective and visible senior management team, broadening the senior management level to include individuals one or two steps down from the executive team and developing future leaders in the organization to fit with the future environment of the reorientation.

Wall Street cultivates a lean and hungry attitude

BY DAVID LUDLUM

From their Manhattan office towers, managers of the nation's leading brokerage and investment banking firms can see shiploads of business opportunity on the horizon. However, the question along Wall Street is whether there is enough cash in the till to build adequate docks.

Last month, for example, the Securities and Exchange Commission loosened its regulation of the private placement of securities. The change made it a lot easier for corporations to sell stocks and bonds directly to big institutional investors. Wall Street's investment banking and brokerage firms expect that business to grow rapidly. They are jockeying to become bigger players, and that means sinking money into new systems.

Right now, however, cash for capital investments is a commodity that is in rather short supply. After the 1987 market meltdown, demand fell for services such as retail brokerage. For a while, other activities, including mergers and acquisitions, picked up the slack, but those have also slowed. Even where services remain in demand, profit margins have come under pressure.

Take securities trading, for instance: The falling price of computer power has let institutions that buy stocks and bonds do sophisticated analyses of prices that only brokers and dealers could do in the past. The result is a smaller spread between bid and ask prices and slimmer profit margins for the sellers.

"The playing field is being leveled. That has changed the business fundamentally," says Gary Curtis, a vice-president in the Chicago office of the Boston Consulting Group. Wall Street companies are saddled with overhead costs originally justified by the profit margins of the past.

Ludlum is a Computerworld senior writer.

Joyce Ravid

Goldman Sachs' Adam *points out the paradox between reduction expectations and new introductions*

"There's a real paradox here," says Rick Adam, a partner in charge of global operations and information technology at Goldman, Sachs & Co. "The traditional products that paid the bills for a few years have slowed down, so people say you should be able to cut back. But traders and salespeople are accelerating the rate of new product introductions."

The new products also tend to be more complicated than the old ones. Goldman Sachs, for example, recently became a market maker for Japanese equity warrants traded in London. To handle the Japanese warrants, Goldman Sach's traders have to have real-time prices of the underlying Japanese stocks and calculate the impact of changes in them on prices for warrants. "A client will call, and you have to be able to give him a quote," Adam says. "From a computing point of view, it's quite tricky."

The company equipped traders with personal computers running Microsoft Corp.'s Windows. The desktop machines are tied to Stratus Computers, Inc. minicomputers and IBM hosts through a cooperative processing scheme, so that the traders get power and responsiveness and the ability to track the mainframe-based inventory.

Goldman Sachs is actually in better shape to deal with the development of complex new systems than are many of its rivals. Firms that tried to offer a broad array of products and services during the heady 1980s face the toughest challenge, according to industry analysts. Organizations that once spent freely and put on fat are now eliminating entire lines of business. Last year, for example, Merrill Lynch & Co. took a $470 million charge for restructuring, including the sale of its Canadian brokerage operations. Also, last month, Shearson Lehman Hutton, Inc. posted a $630 million charge for restructuring, divesting part of a money management business.

Even at companies where such radical cutbacks are not necessary, expenditures are still being watched closely. Goldman Sachs, for example, has no standing order to cut costs, but the firm is generating efficiencies to help finance new projects. Its information systems budget has fallen slightly in the past year, Adam says.

Similarly, Salomon Brothers, Inc., which earned $119 million for the first three months of this year, imposes strict requirements for the justification of any new systems projects. Managers must break each initiative into its component parts and forecast the cost and payback for each one.

For the most part, it's a matter of fewer dollars chasing many more priorities. New products and services have to be developed to repair frayed profits, and those products are often more complicated to support than the traditional lines of business. In areas in which margins have thinned, companies are looking for systems that can help traders make the most profitable use of their time. Many existing systems, which are nearly obsolete after a decade of sweeping change, need to be replaced. Others, thrown together in haste during the boom years to answer specific and pressing

Guess how many ways AT&T c

12 you say? Maybe 45? Possibly 150? Guess again. Did you know that with AT&T, there is virtually an infinite number of ways you can break out billing?

With AT&T DETAIL MANAGER, if you want your billing data broken out by city, we'll do it. Or maybe you'd prefer it broken out by state, area code, frequency of usage, cost category or length of call? And if that's not enough, you can use our free PC software to design your billing data to suit your needs.

And the options don't stop there. Billing reports can be delivered on paper or magnetic tape. Plus many of these reports are free of charge, and most of them are offered with all AT&T calling plans, including AT&T WATS and the AT&T 800 Family of Services.

You can depend on AT&T for accuracy of billing, too. Because with our 100% hardware answer supervision, you'll never be charged for uncompleted calls.

So the answer to this guessing game is, whatever way works best for you. Any other way isn't worth a hill of beans.

...an help you detail your billing.

If you sign up now, you can get up to three management reports on paper or magnetic tape, or call detail on floppy disks, each month __free__ of charge through your September bill. The earlier you sign up, the more __free__ reports you get.

__AT&T DETAIL MANAGER.__
Another AT&T advantage.

For more information, contact your
AT&T Account Executive or call 1 800 222-0400.

AT&T
The right choice.

Wall Street

requirements, must now be reconciled and integrated into companywide architectures. Finally, but far from the least of concerns, the denizens of Wall Street know that they must construct and maintain a coherent systems structure so that they will be able to compete when business picks up and competition hits with full force.

Distributed processing is a top-of-the-list item at many firms. IBM mainframes are the popular choice for transaction processing on Wall Street, but firms embrace different approaches to distributed processing. Many rely primarily on IBM

nomic trends that could affect their value. "These traders often work on very, very thin margins and rather subtle signals to tell them what to do," says Mark Klein, a senior vice-president at The Diebold Group, Inc., in New York.

To give traders all the information they need, companies must integrate workstations with back-office mainframes that clear the trades, transfer securities and generate reports for management and regulators. Traditionally, the mainframes issued reports overnight through batch links, but that approach is not good enough for today's fast-paced trading. Real-time links tell traders which securities the company holds so they won't sell ones that someone else just sold

I N A FAST-CHANGING BUSINESS, Wall Street firms need technology that lets programmers build systems quickly and modify them or move them among hardware platforms easily. But top management has to recognize the value of such seemingly "pedestrian" capabilities.

dle ground in profits and pressure to cut costs, is trying to eliminate less important activities to free resources for new projects. Part of the effort flows from a recapitalization by its parent firm, General Electric Co., in March. In the wake of the financial restructuring, managers are rooting out unnecessary work and inefficient methods. They decided, for example, that needs didn't justify their state-of-the-art, minicomputer-based publishing system, so they replaced it with less expensive desktop

Fine tuning

Financial institutions used to want systems to help them work faster; now they hope systems will help them work better

Top benefits desired from information systems

	1987	1989
①	Higher productivity	Increased effectiveness
②	Increased effectiveness	Better customer support
③	Better customer support	Ability to expand business or services

From a survey of 217 commercial lenders, savings and loans and securities firms

Source: The Sierra Group, Inc.   CW Chart: Marie Haines

Personal System/2s, but Salomon Brothers has committed itself to the Unix operating system: The aim is to leave users free to respond to changing needs.

Goldman Sachs relies chiefly on networks of IBM-compatible PCs, which are tied directly to mainframes and do cooperative processing. Adam says PC local-area networks can do almost anything minicomputers can. The firm is piloting some Unix-based systems, and Adam pre-

Salomon's Dramis *listens to the department footing the bill*

dicts Wall Street will use more Unix workstations for high-power applications, such as trading, while the hordes of salesmen will work with less expensive PCs.

Supporting traders in a distributed fashion is a complicated proposition. A customer might trade one security for a package of 16 others. Traders need information on the potential buyers or sellers, the companies that issued the securities and the eco-

or buy ones that someone else from the company just bought.

The links also make the back offices more efficient. Some traders still scribble down information on transactions, which has to be keyed in by back-office workers. "Passing around tickets with coffee stains and illegible handwriting isn't a very good way to do it," Curtis says. With real-time integration, a trader can key in data and send it to the back office, where systems pull up information such as delivery procedures for the customer.

Real-time integration is crucial in assessing risk. Without it, managers cannot see the firm's holdings in a particular currency or what business it is doing with a given customer, industry or region. But that is not the only reason that distributed processing is such a hot item on Wall Street agendas. Part of the attraction is also that companies see such a move as one way to combine strategic benefit with cost reduction.

Fixed costs account for a big proportion of total expenses for Wall Street firms, Klein says, and one very big fixed cost is mainframe investments.

The idea of reducing mainframe storage and processing costs while also easing access to data exerted strong appeal for Merrill Lynch, says Howard Sorgen, director of information processing and technical services. The company is three-fourths of the way through a project to replace 17,000 terminals at 480 branch offices with PCs, which

operate on LANs running off mainframes in New York. The new system provides retail brokers with real-time transaction data from the mainframe rather than overnight updates.

Investment banking and brokerage firms are also finding other ways of making technology investments pay for themselves. In a few instances, systems developed for internal use have been put on the market as commercial products. One example is First Boston Corp.'s global trading system. Having developed a first-of-its-kind, 24-hour trading system boasting both distributed architecture and full integration between front and back offices, First Boston formed a joint-venture with IBM, called Seer Technology, to sell both the system and the computer-aided software engineering technology used to build it.

At other firms, the strategy is to build cost reduction into system design. By adding functions to its global system for clearing security trades, for example, Goldman Sachs has eliminated the use of third-party clearing agents in various parts of the world, saving millions of dollars, Adam says.

S&L PRIORITIES

Top technology issues cited by savings and loans

1) MS-DOS
2) Personal computer integration
3) Multivendor compatibility
4) Multivendor connectivity
5) IBM's Systems Network Architecture

From a 1989 survey by The Sierra Group, Inc.

In addition, a number of Wall Street companies are working on technologies that could someday work as substitutes for services of the New York Stock Exchange, which charges member firms as much as $20 million a year. Shearson is making its own market in about 50 Big Board issues, mostly closed-end stocks.

At the same time, companies are plunging ahead with investments aimed first at boosting competitiveness. In developing software, Merrill Lynch is adopting wide-scale standardization of software development to allow programmers to bring products to market more quickly. "Eventually, it will be more cost-effective, but the driving force isn't

cost reduction; it's competitive edge," Sorgen says.

This kind of initiative faces the give-and-take of negotiation. At Shearson, standard procedure calls for a committee chaired by the chief administrative officer to review business requirements and approve spending for new systems. It's a tough process, and the bottom line is return on investment, says Rick Morrison, a co-chief administrative officer and head of systems. If a manager can't demonstrate a sufficient return, his project is put off until he can.

On Wall Street, most proposals for spending on technology originate with a business unit, such as an equity or fixed-income trading department. It is typically these user groups that must prioritize projects in making budgets. "We don't do anything without the approval of the people who are paying the bill, and those are the people who are working on the revenue-generating side," says Fran Dramis, Salomon's managing director in charge of systems.

At Merrill Lynch, managers in the central processing group sometimes work out cheaper ways to do things in response to requests from business units. They forecast their expenses by meeting with the top managers of the units and, subsequently, with the software development staff. One step they have taken is discounted rates for processing services delivered during off-peak hours, which discourages business units from using mainframes during prime time. "We turn that cost savings back to the business client," Sorgen says.

At Kidder, Peabody & Co., Robert McKinney, the firm's managing director of systems, has a say in setting systems budgets as a member of the management committee. In that function, he has advocated such projects as the purchase of a new trading system and automation of branch offices. Kidder's IS people and business unit managers prioritize projects with help from software that tracks requests for new systems and work in progress.

Kidder, which occupies something of a mid-

Morrison says Shearson *wants projects with payback*

publishing machines.

Companies have set their sights on a variety of other areas for cutting costs. Merrill Lynch's current effort began in 1986 — long before its recent restructuring — when it hired DuWayne Peterson to ride herd on systems, telecommunications and operations. The thrust has been to consolidate processing and communications, charging business units for services while decentralizing software development among them.

Sorgen says Merrill Lynch is centralizing "utility-like functions" while spending money on strategic initiatives such as structured software development. It plans to cut the costs of central services by 5% to 8% a year; since 1986, it has reduced the ranks of workers providing the services by one-fourth.

A key move has been the consolidation of seven data centers into two "megacenters" designed to provide operational redundancy. This change, which was completed last year, is bringing savings of more than $28 million a year, Sorgen says.

Data center standards and automation are helping Merrill Lynch and other companies take care of business with fewer people. Merrill Lynch standardized

SECURITIES PRIORITIES

Top technology issues cited by securities firms

1) Personal computer integration
2) MS-DOS
3) Multivendor compatibility (tie)
   Multivendor connectivity (tie)
4) Common user interface

From a 1989 survey by The Sierra Group, Inc.

operating systems and scheduling and installed software for monitoring and controlling networks, T1 lines and modems. "The idea is a lot of sophisticated equipment with very few people," Sorgen says.

Kidder has installed data center automation for backup, job control, tape library management, report distribution and transfer of data among incompatible systems. The company leases data center facilities from First Boston but runs its own computers with its own people. Kidder has cut its information systems head count from more than 400 to "the low 300s" in the last two years, according to McKinney. To keep employees motivated and focused on their work — a major challenge — managers hold regular meetings to address concerns of staff members.

Critical ties are prime target

Communications costs have long been a major expense for Wall Street companies and, therefore, a major target of budget-cutting efforts. In recent years, Goldman Sachs has "re-engineered" its network, Adam says. It uses a fiber-optic backbone for voice, data and video moving between the U.S., London and Tokyo. The company has lowered costs 30% while boosting the quality of transmissions and allowing seven-digit dialing worldwide, Adam says.

Shearson has introduced fractional T1 lines to connect certain locations where full T1 would be too expensive to justify. Multiplexer vendors design and help install the networks, which are cheaper and more reliable than conventional analog circuits.

All the companies are cutting costs by bargaining more aggressively with vendors. They are taking advantage of negotiated rates for telecommunications, such as AT&T's Tariff 12. Merrill Lynch has tapped MCI Communications Corp. as its sole telecommunications provider. In a turnaround, however, it recently backed off from a plan to outsource network management to MCI and IBM. Top management decided network control is too critical to outsource, Sorgen says.

Shearson has been cutting better deals with suppliers of computer equipment and communications services through the buying power of its parent, American Express Co. McKinney says Kidder is saving money by buying First Boston's global trading system. "Today, it would cost anyone $100 million to build," he says, while purchasing it cost a small fraction of that amount.

At Shearson, the focus of cost-cutting
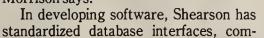
is software development. The company is redesigning software to run in a more efficient parallel mode on the six-processor IBM mainframes in its new Manhattan data center. The idea is to accommodate business growth with minimal increases in hardware costs. "We don't want to build these mammoth systems that are CPU hogs," Shearson's Morrison says.

In developing software, Shearson has standardized database interfaces, com-

At Merrill Lynch, Sorgen *urges off-hour processing*

munications and presentation. "The term we use is 'snap-on,'" Morrison says. With the approach, development is less labor-intensive and more simple; programmers don't need to know the operating system in as much detail as before. Since applications look more similar, maintenance is easier, too, he says.

At Merrill Lynch, business units do their own software development, but the central services group provides processing for them. It is cutting costs by offloading

some of the work to PS/2s. The firm thinks each programmer is costing 16% less in processing resources, Sorgen says.

State-of-the-art software development is definitely an area in which Wall Street firms need to invest, says James Emery, a professor at the University of Pennsylvania's Wharton School. In a fast-changing business, they need technology that lets programmers build systems quickly and modify them or move them easily among hardware platforms. But top management has to recognize the value of such seemingly "pedestrian" capabilities. Given pressures to cut costs, Emery says, it's becoming harder to get money for investments that are perceived in this way. "But," he adds, "I'm extremely bullish about it in the long run." •

Bye-bye

Now there's a way to solve your software development backlog problems.

And Digital has it today.

It's the only kind of solution to the problems of developing software that really works.

A total solution.

It's Digital's complete CASE environment. It gives developers of commercial and technical applications a totally integrated approach to software development – something that's essential to the software development cycle and accelerates it in ways that CASE tools alone never could.

☐ WRITE ONCE AND FOR ALL.

What's so unique about Digital's CASE environment is what it lets you do. That's because it rests solidly on a foundation of architectural standards that are both open and flexible.

A case in point. Our CASE tools are supported by Digital's Network Application Support (NAS). Digital's NAS lets you develop applications for computers with one operating system, yet run them on different computers with different operating systems. The competition can't offer this level of integration for saving time and money.

☐ A FRAMEWORK THAT REALLY WORKS.

We also offer a CASE integration framework, specifically designed for software development. As with our architectural standards, the framework is open, flexible and complete.

WE'RE THE T1 SUPPLIER WITH TOTAL NETWORK SOLUTIONS.

It may not be common knowledge, but Codex has been connected with T1 and other digital technologies almost as long as T1 has been connecting information centers.

In fact, Codex was one of the first to see the cost and availability advantages of fast packet technology for T1 networks.

But no T1 network can stand alone. It has to be part of a complete network solution. And there's no T1 supplier better at total network solutions than Codex.

We have 28 years' experience designing, installing and supporting multi-technology networks in 44 countries worldwide. Including more T1 fast packet networks than anyone else.

Which explains why we can offer the best solution for integrating T1 into your current information systems environment.

If you'd like to learn more about our T1 capabilities, call us at 1-800-426-1212 ext. 7232. We'll send you a free copy of our "Applications Booklet of T1 Fast Packet Technology." It's the first step in finding out what our experience can do for you.

codex | THE NETWORKING EDGE

Ⓜ **MOTOROLA**

"I DIDN'T KNOW CODEX DID THAT."

INTERVIEW

Staying in step with the times

*KPMG Peat Marwick's Erich Sippel says 'traditional'
financial services firms need better performance-measuring
systems to keep up with changing market realities*

The basic definition of financial services is fairly simple, says Erich W. Sippel, senior manager at KPMG Peat Marwick in Philadelphia and New York; it means getting those with money to lend together with those in need of investment funding.

This exchange, however, can be structured in innumerable ways. Traditional financial services institutions, including banks, thrifts and insurance carriers, are facing a creative challenge from rivals such as securities firms and insurance brokers.

Ultimately, Sippel says, the financial services providers that will thrive will be those that spot possibilities for innovation in investment instruments. Computerworld Features Copy Editor Cathleen Duffy recently spoke with Sippel about what so-called traditional firms must do to keep up.

What are the biggest strengths of the newer financial services providers?
I like to think of these newer rivals as creators of financial innovations. These are the companies that have come up with innovations such as money-market and mutual funds, junk bonds, mortgage-backed securities and noninsurance methods for managing property and liability risk.

What kind of an advantage has this creativity given them over the more traditional providers?
The biggest advantage they have is being able to meet the same market needs in ways that are less capital-intensive.

There are five basic ways to make money in financial services:
1) You can assume someone else's risk.
2) You can manage the spread, which means obtaining money cheaply and lending it expensively.
3) You can aggregate, which means managing money in something like a mutual fund, without assuming any of the risk.
4) You can process information by handling transactions, administering accounts or gathering, reformatting and selling investment data.
5) You can act as a distributor, selling financial instruments on behalf of the originator and/or reselling them in the secondary market.

I've listed these possibilities in order of their capital intensity. What that means is that if most companies are meeting the current need of the market by managing the spread and you can do it by processing information, you win. Or, if they're doing it in any of the first four ways and you can do it by distributing, you win.

Is the problem that the traditional intermediaries shy away from change and risk?
They don't exactly shy away, but they are prisoners of the patterns of thought and perceptions built into the traditional paradigm of the financial services industry.

Their cultures are basically risk-averse. This sort of thing happens to companies of all kinds. They start out as entrepreneurial, risk-taking ventures, but, over time, they evolve and are taken over by professional managers and bureaucracy. That's OK if the environment remains stable. But if the environment starts to change, it can mean real trouble.

What kinds of measures will enable traditional providers to survive in the financial services world?
They're very used to thinking in terms of conventional categories — banks, thrifts, life insurance companies. What I'm saying is that those categories are becoming irrelevant, and these companies will go a lot further if they stop thinking in terms of old definitions and start thinking in terms of what market needs they meet, how they make money and what the return on capital investment is from that method of making money.

I like the quote by Charles Revson, the founder of Revlon, who said: "In the factory, we manufacture lipstick, but in the store, we sell hope." People buy something important to them; they don't buy what companies decide to manufacture.

Do traditional providers need to change their work processes for their product innovation?
I can't answer that across the board — some do and some don't. But virtually everybody needs to put systems in place to measure performance. They need to be able to answer questions such as: What market need are we meeting? How much of our capital is tied up in that? How much money do we make? And

Sippel: *Firms will go further if they stop working with old definitions*

what is the return on invested capital?

Those are pretty fundamental questions for any business, and yet, hardly anybody in financial services can give you hard-edged answers to those questions.

Why can't they?
One reason is that systems inside companies are not set up to gather that kind of information.

Could a change in the way they use information technology help?
It primarily depends on how the company is going to make money and what its strategy is. Nevertheless, I think that it's safe to say that in all of these companies, their end product is information, so they've got to be able to process information effectively. It's part of the cost of entry into the whole game.

If you're going to make money by processing information and you're going to do it by processing transactions, you've got to recognize that this is a business a lot like traditional manufacturing, where big economies are derived from scale, and the key to success is getting down the experience curve quickly. That argues for heavy investments in technology.

How do the traditional providers' investments in information systems compare with those of their newer rivals?
They spend a lot of money. But *everyone* in the financial services arena spends a major amount of money on technology. Securitized mortages compete with mortgage lending. Salomon Brothers largely invented securitization. So, if you're asking, does Salomon Brothers spend more money on technology than the typical large thrift and is that the key to their success, the answer to that question is I don't know. Everybody spends a lot. Is that the key to the success of the innovation? The answer is no.

Can technology and the people who manage it help spark innovation?
Let me tell you about one client of mine. This client asked me to help them figure out what they should do with technology, marketing and customer service. I came in and realized they really didn't have any strategy. They had a lot of ad hoc decision-making, and they had a lot of projects. They were very bright, capable people, but there was no overall coherent approach to the marketplace. Without that kind of frame of reference, I couldn't answer the questions they were asking. What you're going to do with technology depends on what you're going to try to do as a business. What I had to do was help them figure their overall strategic approach. Once that was possible, then the implications for technology, customer service and marketing were easy. •

As Global Competition
Systems Must Change To

Intensifies, Information A Competitive Weapon.

Economic experts agree that the 1990s will see unprecedented competition in global markets.

Key to your company's survival in this new competitive environment will be the adoption of a new computing strategy in which information systems can truly become a competitive weapon. A strategy far more flexible and able to adapt rapidly to change than those of the past.

Open, Cooperative Computing is NCR's blueprint for such a strategy. Its openness gives you the widest possible choice of hardware and software. So you can add applications and functionality quickly.

Its client/server architecture lets you distribute computing resources more efficiently. Its intuitive graphic interface gives you transparent access to information enterprise-wide. So you can respond to customer and market needs more quickly and more effectively.

And it provides a bridge to your current information systems that preserves your present investment in systems, applications, and data.
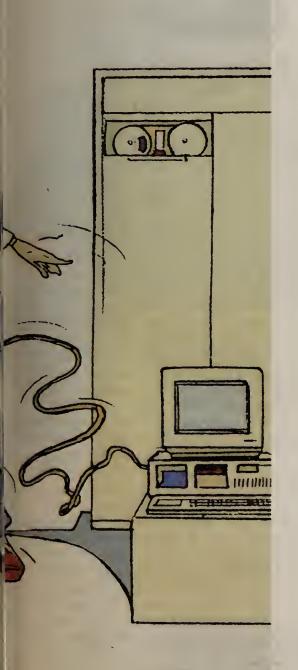
NCR is a leader in open systems solutions. We build the most complete set of end-to-end, industry-standard products. And no one has more experience connecting multivendor environments, via SNA, OSI, and other communications methods.

Open, Cooperative Computing is a strategy that will shape the future of information systems. The time to begin implementing that future is now.

For details on how to turn your information systems into a competitive weapon, phone 1-800-CALL NCR.

NCR
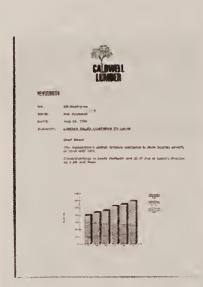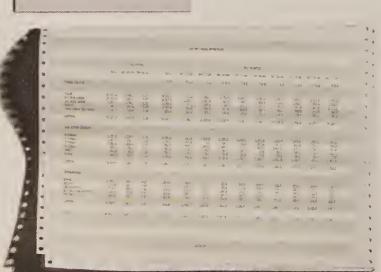
Open, Cooperative Computing.
The Strategy For Managing Change.
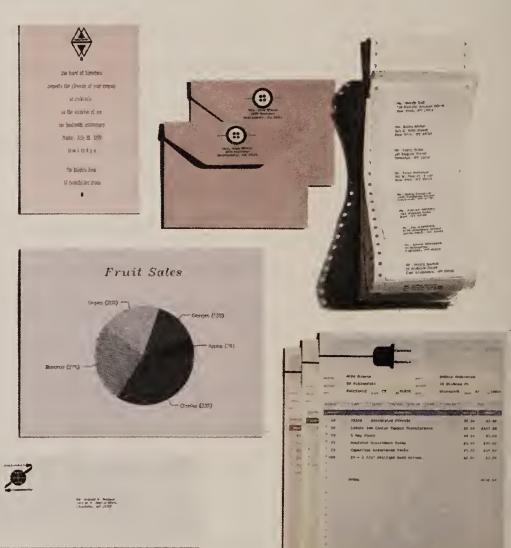
Now save up to 20% on the family of printers that goes to any lengths (or widths) to please you.

New exceptionally competitive prices can now be added to the long list of the IBM Proprinter's selling points.

The IBM Proprinter™ family is the kind of family that can't do enough for you.

And now, with their new reduced prices, current IBM Proprinters will do it all even more economically. From multi-part forms to correspondence and envelopes, to spreadsheets and mailing labels, to just about any other printing job.

Since all Proprinters share important IBM engineering design innovations, like streamlined mechanics and a convenient

front feed, they can accommodate this wide range of applications with exceeding ease, reliability and value.
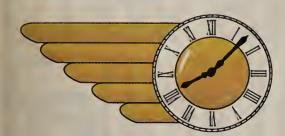
To see which competitively priced IBM Proprinter best meets your needs, ask your IBM Authorized Dealer or IBM marketing representative to introduce you to the whole family and the new prices. Call 1 800 IBM-2468, ext. 226 for a dealer near you.

IBM

Beating the clock

Time margins are slim in the financial services industry these days. Investors want to respond immediately and intelligently to quicksilver market changes. They also want this fast-response capability to stretch around the clock and around the world.

This imperative is fueling more innovative applications and ambitious leveraging of information systems and networks. Below are examples of companies stretching information and communications systems to cover new market needs.

Chicago Mercantile Exchange

The pits may close, but trading goes on. There is always action in some corner of the world, particularly when it comes to foreign currencies and Eurodollars, and that far-flung action is becoming too important to miss. That's why the Chicago Mercantile Exchange (the Merc) decided to partner with the Reuters information and newswire service in September 1987 to develop the Globex electronic trading system. Globex, currently in alpha testing, will extend trading hours long after the pits close, operating from 6 p.m. to 6 a.m. Chicago time.

"Laws have changed, says Jack Walsh, vice-president of Globex marketing. "Governments in countries like West Germany and Japan are now allowing the establishment of exchanges. Institutions and individuals in those countries can now trade futures from their homelands. We wanted to attract new participants, but we also wanted to protect our beachhead." The only way to do that, Walsh says, was to adjust trading hours to clocks in the new trading territories.

Buyers and sellers enter bids and offers using terminals called keystations. These statements are transferred to a host processor in Hauppauge, N.Y., for sorting and matching. Prices from

The Merc's Serpico successful matches are fed from Hauppauge to the exchange in Chicago, which feeds them to 56 quotation distributors. The distributors in turn send prices to terminals worldwide. A clearing system processes trades and, at the end of each trading day, determines winners and losers, based on settlement prices. A process called the banking cycle transfers money from losers to winners.

The partners are dividing the technical tasks. Reuters is programming the host-matching and keystation systems, while the Merc is programming the ticker network and the clearing and banking systems, explains Donald Serpico, senior vice-president of operations.

The keystations are Intel Corp. 80386-based IBM-compatible personal computers with specially designed keyboards. The host processor in Hauppauge is a Digital Equipment Corp. VAX 8800. In Chicago, quotes and trades are processed through Tandem Computers, Inc. machines, then routed to the Merc's IBM 3090 mainframes, which perform the clearing process.

Globex is being alpha-tested in London, New York and Chicago. Beta testing is scheduled to start at the end of this month and run through June. The actual start date will be determined by the success of the beta testing. Even so, plans are already under way to bump up the network's capacity, Walsh says.

Security Pacific Merchant Bank

Administering syndicated loans — large loans broken up among a group of lenders — is a notoriously complicated business. But thanks to an internally developed system, Security Pacific Merchant Bank in New York is finding the job less onerous these days.

The system is the work of a two-man team — a consultant and an employee in the bank's Corporate Financing and Banking, Loan Sales and Syndications department. An ongoing project, the system speeds and simplifies the company's work as an agent bank coordinating tens of billions of dollars worth of syndicated loans.

Acting as the agent for loans is difficult in the first place, says Joe Holliday, the inside developer on the system and principal in charge of operations at the bank. "Now, the speed at which people are administering deals — as well as additional options for borrowers and short turnaround times — makes it very difficult to automate. But it's necessary."

To make a large commercial loan in the past, he explains, an agent bank would send invitations to as many as 40 to 60 other banks to join a syndicate as lenders. But now, in the interest of faster turnaround, fewer banks are solicited to lend larger amounts. This can only be done, however, with the proviso that shares in that investment can be resold to smaller banks.

As a result, the agent bank acts as the liaison between not only the borrower and the lead banks but also between the lead banks and the subparticipants.

Although this new process is faster, it is also very complicated. The agent bank must communicate all loan activity to all participants. Automating this process in the short time allotted required a radical approach.

Holliday doesn't believe in lengthy specifications. "We had to create complex databases and get applications up and running in no time, so we decided to throw the rules out the window and go," he says. Consultant Mike Joblin, at Rational Software Technology Co. in New York, and Holliday used both Corvision, an integrated computer-aided software engineering tool from Cortex Corp., and a modular approach to expedite the development task.

"When every deal has a new wrinkle, you want to automate the most common components," Holliday says.

The system was developed and runs on a VAX 6320. Used by loan managers and their operations staff, it now contains more than 300 reports, 700 menu selections and 100 data-entry screens.

The team's next job is to generate more management information reports. "In investment banking, we live in an environment of instant response," Holliday says. "We're trying to supply support that can squeeze as much as possible out of systems."

Fidelity Investments

Expanding product choices, rapid regulatory shifts and more diversified portfolios all combine to make well-coordinated account services a must in the retail investment business, says Steve Jonas, senior vice-president of retail strategic business systems at Fidelity Investments in Boston.

When investors call these days, they seldom ask a single simple question, Jonas says. More typically, customers dial in with multipart inquiries that involve more than one existing account as well as other funds that interest them. They may need quotes or account balances, they may be responding to promotional mailings or they may want to discuss the feasibility of a particular investment or transfer.

Resolving questions this varied in the course of a single phone call is no small challenge. "We have 150 products and five million accounts," Jonas says.

Moreover, that information is scattered among different databases on different mainframes. "Brokerage accounts are not in the same place as mutual fund accounts," Jonas says. "The database that tracks problem inquiries is in one place, information on customer mailings is someplace else, and price quotes are in yet another place."

Fidelity's Jonas A new and ambitious presentation application was the solution. In the past, customer service representatives, who constitute the front line of the business, were connected to the firm's IBM mainframes via dumb terminals. They could interact with only one mainframe at a time and one screen at a time. Fidelity now has replaced those terminals with Intel 80386-based PCs that integrate information from a variety of mainframe applications using an in-house-developed customer service application.

The application, which uses hypertext, runs under DOS in Microsoft Corp.'s Windows environment. The PCs, located on representatives' desks at telephone centers in Boston, Dallas, Salt Lake City and Cincinnati, are connected by local-area networks to 386-based servers at the centers, which in turn communicate to remote mainframes in Boston and Dallas.

Because the software has an intuitive presentational layer, Jonas says, representatives need only point and click to initiate requests. They can call up customer profiles, detailed funds descriptions, tax information and account histories.

The system, which took 15 months from conception to first production installation, is in the early stages. It now has 120 users.

"By the time the application is fully rolled out over the next two years, there will be 1,000 users," Jonas says.

FNN Data Broadcasting Corp.

Thanks to a unique blend of broadcast and satellite technology, subscribers to services of FNN Data Broadcasting Corp. in San Mateo, Calif., never have to wonder for more than a few minutes what the market is doing.

The company, a subsidiary of Financial News Network, Inc., broadcasts market information over an FM sideband to a mix of 80% individual investors and 20% corporate clients. All of FNN Data products rely on FM sideband and satellite technologies. Sideband is a subset of the frequencies used by FM carriers.

The company's approach differs from that of quotation distributors such as Reuters and Dow Jones & Co., which use leased lines to deliver information.

Newsreal is a new software product, which, through an arrangement with the Dow Jones News/Retrieval service, delivers financial news. The user tells Newsreal what to look for and when. For example, an investor might specify the computer industry, the categories of hardware and software and the companies. Customers can also set Newsreal to dial into the retrieval service at regular intervals.

Two older products — Quotrek and Signal — have been available for several years. Quotrek is a portable, handheld device that delivers real-time quotes. Signal is an FM receiver that plugs into an IBM Personal Computer. Each product can be used alone, but using Signal and Newsreal together, a customer can program Signal to control what information Newsreal dials up.

All U.S. exchanges use automated systems that capture all transactions, including shouted instructions and hand signals. This information is distributed through leased lines to many data distributors, including FNN Data. At FNN Data's computer center, that data is dumped into several VAXs, where it is indexed and continually updated. The information is then uplinked to a satellite, which transmits it to dishes at participating FM radio stations across North America. There the information is formatted and rebroadcast to customers.

FNN Data is considering the development of other broadcast technologies as information delivery mechanisms, says product manager Lee Siegfried. One possibility is to use vertical blanking interval on cable television, which is used for closed-caption broadcasts. Vertical blanking interval offers greater bandwidth, which means the possibility of supplying more kinds of data.

"Now, we just broadcast the last trade," Siegfried says. "Why not broadcast earnings per share, split information or relative strength indicators?"

By Barbara Francett, a free-lance writer in Bloomfield, N.J.

Here are 43 reasons why the new controller

They all add up to one very important reason. The new IDEA Concert lets you integrate more hosts upstream and more devices downstream than any other controller on the market. IBM mainframes, IBM midrange systems, DEC VAXs, asynchronous hosts, coax, twinax and ASCII devices, you name it. All work in concert, so you can maximize your investments and increase productivity. The IDEA Concert Controller. And now, we'll let the numbers speak for themselves.

1. Talks to IBM 370 class mainframes

2. Talks to IBM AS/400 midrange systems

3. Talks to IBM System 3X midrange systems

4. Talks to DEC VAX systems

5. Talks to other asynchronous hosts

6. Talks to Unix hosts

7. Talks to multiple hosts (up to 4)

8. Talks to a combination of different host types

9. Talks to up to 56 coax devices

10. Talks to up to 42 twinax devices

11. Talks to up to 80 LAN devices

12. Talks to IBM 3270-type displays

13. Talks to IBM 5250-type displays

14. Talks to IBM InfoWindow displays

everyone's talking about ... from IDEA Courier.

15. Talks to IDEA 9000 series terminals and printers

16. Talks to IDEA 12000 series terminals

17. Talks to IDEA 177, 197 and 277 series terminals

18. Talks to DEC VTXXX terminals

19. Talks to DECServer 200/550

20. Talks to IBM 3270-type printers

21. Talks to IBM 5250-type printers

22. Talks to IDEA 13000 series printers

23. Talks to IDEA 244 series printers

24. Talks to host-addressable PC printers

25. Talks to local devices

26. Talks to remote devices

27. Talks to a PC emulating a twinax terminal

28. Talks to a PC emulating a coax terminal

29. Talks to a PC emulating an ASCII terminal

30. Talks to Token Ring networks

31. Talks to DEC LAT networks

32. Talks to X.25 networks

33. Talks to IBM's AS/400 PC Support application

34. Talks to synchronous modems

35. Talks to SNA/SDLC environments

36. Talks to SAA compatible devices

37. Talks to IBM NetView

38. Talks to host as multiple logical units

39. Talks to IDEA Advanced Function Terminals

40. Talks to coax multiplexers

41. Talks to asynchronous multiplexers

42. Talks to concurrent gateway and downstream physical units

43. Talks to entire system through remote diagnostic capabilities

44. Talk to IDEA. **1-800-528-1400**

IDEA

The intelligence to communicate better.

IDEA Courier   IDEAssociates   IDEA Servcom

The IDEA Courier team of terminal. It adapts to

It's mainframe. It's midrange.

It's entry-level. It's high-function.

Since both technology and business are always evolving, why limit yourself to equipment that can't? Introducing the 12000 Series of coax displays from IDEA.

The 12000 Series terminals feature a versatile modular design. A design that gives you the power to add functions and upgrade your terminals to keep pace with future requirements.

You can start with an entry-level display then, as your needs grow, upgrade to a high-function display simply by plugging in a new logic module.

You can also change from twinax to coax, or vice-versa. So if your company has both IBM mainframes and AS/400s, you have the flexibility to work with either.

The benefits of modularity make the 12000 Series easy to service, too. Should an element fail, it can be replaced in the field within minutes, reducing downtime and maintenance costs.

As you've come to expect from IDEA Courier, the 12000 Series displays are rich in product features. You can choose either a 14″ or 15″ flat-faced, high-resolution screen, each with a removable tilt/swivel base and 104- or 122-key adjustable keyboard. In addition, the 15″ model is available with a mono-

announces a new species
a changing environment.

It's financial. It's medical.

It's manufacturing. It's insurance.

chrome or color display.

For extra productivity, the 12000 Series terminals come with light pen support, auto keystroke storage, screen print buffers, set-up menus with pop-up windows, four screen sizes including 132-column and on-screen calculators with our exclusive data import and export capability.

All models feature parallel support for local printing with a display-attached printer, while high-function displays give you the option of host-addressable printing as well.

Because so many users depend on it, the 12000 Series

terminals include a three-year on-site warranty from IDEA Servcom. Our own support group providing maintenance for all your computing equipment.

The 12000 Series from IDEA Courier. In the evolution of the terminal, there's never been anything like it. For more information call **1-800- 528-1400**.

IDEA

The intelligence to communicate better.

Future fortunes hinge on present IS choices

BY GREGORY SCHMIDT

The financial services industry will be a whole new ball game within a few years as a shrinking field of players takes on more roles and diverse approaches to serving the customer. The rela-tive positions of those that re-main will be primarily deter-mined by information systems choices being made today.

Until recently, the financial services industry was based on a strongly protected and institu-tionalized role as intermediary between buyers and sellers, lenders and borrowers, payers and providers and individual and collective risks. That role was predicated on exclusive posses-sion of information that could be used to assess risks and recon-cile the needs of parties on both sides of a financial transaction.

When computers made this information widely available, however, all the rules began to change. Deregulation and the appearance of a more sophisti-cated, demanding breed of con-sumer/investor combined to ex-plode the quasi-monopolies of traditional financial institutions.

A whole new range of prod-ucts and services appeared, many of which were the cre-ations of companies never before seen in this arena.

The following are just a few of the major changes brought about by new information capabilities:

• **Securitization.** The practice of collecting large numbers of small loans with some common characteristics (trade credits, mortgages, credit-card loans, deposits) allowed the backing of securities that could be market-ed and sold directly to savings customers.

• **Disintermediation.** Using credit ratings and investor net-works, borrowers avoided tradi-tional intermediary institutions and went directly to lenders with commercial paper and private bond placements.

• **Rapid settlement.** Improve-ments in processing technol-ogies allowed the Federal Re-serve to speed up check settle-ment dates dramatically so that banks' ability to earn interest on float all but disappeared.

• **Mutual funds.** The enhanced ability to manipulate a large portfolio led to the creation of large investment pools that fo-cused on a variety of areas from stock indexes to foreign curren-cy. The net effect was to make a range of sophisticated invest-ments available to the small in-vestor outside of the major mar-kets.

• **Self-insurance.** Companies began finding that they could manage their own risks effec-tively. For example, most large firms now self-insure for health care.

Although financial services firms have seen traditional mar-kets erode with the emergence of these nontraditional services, they have also been able to cre-ate additional sources of income using information technologies. Each year, they devise new types of credit — from variable-rate loans and equity lines of credit to checking account over-drafts and unlimited credit-card accounts.

Even more importantly, banks are finding that noninter-est income — derived from fees, transaction charges, information and advice — is becoming the fastest growing item on their balance sheets. Over the next decade, information technol-ogies will play an even more im-portant part in defining the com-petitive position of financial institutions.

In fact, their greatest chal-lenge will most likely be dealing with commoditization of infor-mation.

With information gathering and processing becoming both easier and more affordable,

Schmidt is a senior research fellow at the Institute for the Future in Menlo Park, Calif.

developing value-added products will become more difficult and sustaining a long-term competitive advantage virtually impossible.

As a result, every financial institution will be forced to pick a strategy for action. Among the major choices are the following:

• **The technological solution.** National or major regional banks and thrifts, national insurance firms and large investment banks may want to develop large-scale systems that coordinate information on markets and customers, transaction records and settlements, risk and portfolio assessments and direct ties to their customers.

This will be an extremely expensive proposition because systems must continue to evolve as competitive products emerge. Only the largest firms will be able to take this route, but it will enable them to offer a full range of global services to major business clients and sophisticated consumers.

• **Customer service.** Other firms may be able to settle for standardized systems that are modular in nature, making it easy to add when new needs and

WITH information gathering and processing becoming both easier and more affordable, developing value-added products will become more difficult and sustaining a long-term competitive advantage virtually impossible.

capabilities arise and to subtract when products become outdated or nonprofitable.

Institutions opting for this choice, however, will have to allocate substantial resources to improve their links with the customer by offering a personal banking officer, friendly insurance agent or daily phone contact with the investor.

In this strategy, the added value will be the communications technology that allows each organization to present relevant and current market choices to each of its customers.

• **Market management.** Still another choice will be to focus resources on gathering and assessing information about target markets.

A health insurer, for example, might concentrate on building an information inventory that allows it to negotiate provider costs in a managed care context, whereas a bank or a thrift might focus attention on a given type of commercial property development. A commercial paper deal-

er could establish its own credit ratings. The key to success for any institution choosing this approach would be fast, full and accurate market information.

• **Niche identification.** Finding a niche — such as a secondary market in municipal paper for small borrowers or a specialized reinsurance market — will be an option for the firm seeking to establish itself as a specialist without the inordinate cost of running a comprehensive system.

How realistic any of those options will be for a given financial institution will depend greatly on decisions that are being made right now about information systems and, more specifically, on how well informed those decisions are.

Future corporate strategy will be determined by how effectively decision-makers can now answer questions such as the following: How much will it cost to establish and maintain a national debit card system? How quickly should an international investment portfolio respond to shifts in exchange rates? What are the most appropriate ways to reach middle-income households for the wide array of financial products and services?

Technology will always be a consideration in strategic planning. However, for at least the next few years, major strategy options for financial service firms will be almost completely dependent on answers about the costs of information systems and about how those systems can change relationships with consumers. •

Trusting Your CASE Operation To Someone Without Our Experience Could Be Just As Scary.

Your CASE operation is too critical to trust to an amateur. That's why you need Index Technology, the world's most experienced CASE provider. As the developers of the Excelerator® Series, we've helped tens of thousands of users around the world implement successful CASE solutions. And we've got the CASE histories to prove it.

What makes us different from the other CASE companies? Simple. At Index Technology, we don't just sell you a lot of flashy technology and then disappear.

Instead, we give you everything you need to make your CASE operation succeed—including proven technology, adaptable products, and an array of support services rated the best in the business. We show you how to get results, and then we stay on call to make sure that you do.

Over the years, that total-solution approach has earned us the trust of our customers. Including IBM, our biggest customer of all. In fact, IBM has so much confidence in us, it's purchasing an additional 2250 copies of our Excelerator products for its own use worldwide.

So it's no wonder that IBM is marketing our Excelerator Series as part of its own AD/Cycle™ offering. Or that IBM is relying on our advice in designing the Repository's information model. Which means our customers never have to worry about the long-term health of their CASE investment.

The fact is, we have so much faith in our CASE solution, we encourage 60-day product trials. We're the only CASE vendor who does. We think that says a lot about us—and even more about our competition.

But don't take our word for it. Get a second opinion. Call us for details on actual CASE histories, and find out what our customers have to say. Then try the same thing with our competitors.

We think you'll feel better with someone who's performed this operation before. And succeeded.

Index Technology Corporation, One Main Street, Cambridge, MA 02142, 1-800-777-8858.

Index Technology

There's No Substitute For Experience.

Move over, Unix: Here comes Mach!

This fast riser is not just for defense anymore

BY GARY H. ANTHES

It is an irony of the Unix wars that the winner may not be a version of Unix at all.

Propelled by factors that are likely to dominate computing in the 1990s, the industry is increasingly turning to Mach, a born-again, Unix-like operating system from the University of California at Berkeley that offers high portability, support for multiprocessing, robust security — and freedom from AT&T licensing requirements.

Mach has roots predating Unix, but in its modern guise, it is being developed by Carnegie Mellon University using the University of California at Berkeley's Unix 4.2 version of Unix as a starting point.

Mach is funded largely by the Pentagon's Defense Advanced Research Projects Agency. DARPA wants an operating system that is highly portable, scalable for use in aggressively parallel supercomputers and able to evolve into a highly secure system — just the things needed to support advanced weapons and other military projects.

While Mach may still be considered by some to be a research project, it has turned into the operating system of choice at Carnegie Mellon. According to Richard Rashid, Mach project director at the university, Mach is the primary operating system on some 550 machines there, including Digital Equipment Corp. VAXs, Sun Microsystems, Inc. workstations, Intel Corp. 80386-based personal computers and Apple Computer, Inc. Macintosh IIs.

Mach is not just for defense anymore. So far, Carnegie Mellon has shipped research versions of Mach to 157 corporations and 91 universities.

Next, Inc. and Encore Computer Corp., among others, sell computers running Mach. Mt. Xinu, a small Berkeley, Calif.-based company, sells supported versions of Mach for Sun workstations, DEC VAXs and IBM RT workstations. Mt. Xinu also has versions in the works for 386-based PCs, Macintosh IIs,

Anthes is *Computerworld's* Washington, D.C., correspondent.
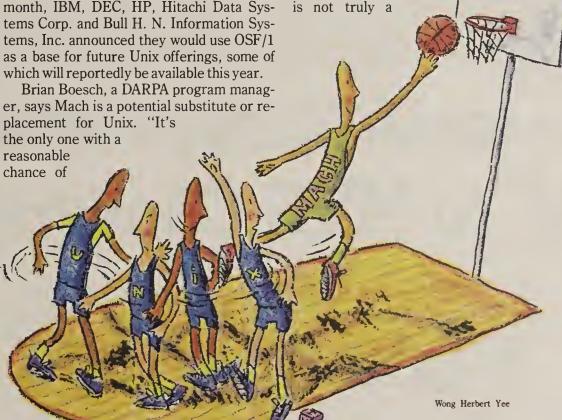
Mips Computer Systems, Inc. reduced instruction set computing microprocessors, Hewlett-Packard Co. 9000 series and others.

Carnegie Mellon has ported Mach to a number of other platforms, including a 30-processor system from Sequent Computer Systems, Inc. in Beaverton, Ore., several VAX models, IBM's 370 and computers based on Motorola, Inc.'s 88000 and 68020 processors, as well as Intel's I860 and 386 processors.

Meanwhile, Carnegie Mellon and DARPA are working with another small vendor and the National Security Agency to develop a highly secure version of Mach. Some believe that such a version could have great commercial appeal, especially for banks.

Propelled forward

In the biggest boost for Mach so far, the 170-member Open Software Foundation (OSF) chose the operating system in November as the cornerstone for OSF/1, its would-be industry standard operating system. Last month, IBM, DEC, HP, Hitachi Data Systems Corp. and Bull H. N. Information Systems, Inc. announced they would use OSF/1 as a base for future Unix offerings, some of which will reportedly be available this year.

Brian Boesch, a DARPA program manager, says Mach is a potential substitute or replacement for Unix. "It's the only one with a reasonable chance of

offering high trust, and no other Unix supports multiprocessing. When push comes to shove, Mach or Mach concepts will crowd out Unix," he says.

"It was clear we needed Unix-like functionality," says Avadis Tevanian, manager of systems software at Next. The company wanted a more advanced environment than was offered by MS-DOS, he says — specifically, one offering multitasking, virtual memory and Unix tools.

AT&T's Unix System V, Berkeley's Unix and other Unix variations were not the answer for Next; they had evolved in a time-sharing world and carried too much excess baggage to be appropriate for the desktop, Tevanian says. "Deep down inside, people know they need Unix, but there are problems they are afraid of," he adds.

The power of Unix without the baggage was attractive, Tevanian says, as was Mach's ability to support graphics animation.

Although Mach is not truly a

Wong Herbert Yee

....

• **In testing at more than 200 organizations**

• **Endorsed by OSF, Next and others**

• **'Unix without the baggage'**

real-time operating system, the Mach kernel is ideally suited for embedded and real-time use, says Alan Tobey, a marketing manager at Mt. Xinu.

The company hopes to work with several firms to adapt Mach for applications such as high-speed switching and communications controllers.

Carnegie Mellon's goal — only partly achieved so far — is to build a Unix-free Mach kernel, a set of "primitives" that control basic hardware functions such as

cally replacing that with its own software.

The Mach Release 3.0 kernel will be entirely free of Berkeley and AT&T code, Boesch says, and a later release — dubbed 3.X — will have purged the proprietary code from the Mach servers and libraries as well. According to Boesch, this will result in a Unix-like operating system free of any requirement for an AT&T or a Berkeley license.

OSF took a version of Mach from Encore — which had already added features

Unix can be taken to the level of trust that TMach will offer because the existing Unix kernel is enormously complex, says Stephen Walker, president of Trusted Information.

TMach is intended to win certification by the National Security Agency at a B3 level of trust. This is the next-to-highest rating on NSA's scale, which ranges from D, offering minimal protection, to A1, providing extremely rigorous safeguards.

As user concerns mount over breaches in computer security, TMach, like Mach, seems likely to move beyond the confines of the defense and intelligence communities. "As soon as someone can deliver a DBMS for a B3 system, banks will want it," Goldstein says.

Mach concepts may eventually permeate Unix. A source close to AT&T says that some of the company's Unix developers use workstations displaying two active windows — one holding Unix System V, Release 4 and the other Mach. Whether Mach code or just Mach concepts flow from one window to the other is not clear, the source says.

Ours is better

Not surprisingly, OSF touts the benefits of Berkeley's Unix 4.2-based Mach at the expense of archrival Unix International, which wants to establish its own industry standard based on AT&T's Unix System V.

"We see OSF as a beneficiary of BSD [Unix 4.2], not a competitor. But we think multiprocessing plus B3 [security] will lead people to choose OSF over System V," Goldstein says.

"That's poppycock," says David Sandel, marketing vice-president at Unix International, the 150-member consortium that defines Unix System V, Release 4 requirements for AT&T implementation.

Sandel says Unix System V, Release 4 will be certifiable for a B2 level of trust — just below that of TMach and OSF/2 — by late this year or early 1991.

He also says Unix System V, Release 4 will offer parallel multiprocessing for shared-memory architectures one year

after that. Sandel adds that Unix International has evaluated Mach and may incorporate some Mach concepts in Unix System V, Release 4.

Addressing the charge that Mach already has multiprocessing capabilities while Unix International has only a plan, Sandel counters: "Unix System V is a commercial operating system with many years of testing behind it. Mach is a research project — that's a major difference."

According to Next's Tevanian, Mach does not compete with Unix but is rather a base to build Unix on. For example, he says, Mach's file system today is the one used in Berkeley's Unix 4.2, but it will be rewritten and greatly improved by Carnegie Mellon.

Tevanian says, "Mach in a sense will save Unix, causing it to evolve in a positive way. Whether you call it Unix or Mach, who cares?" •

Mach history

The evolution of the Mach operating system

CW Chart: John York

virtual memory management, message passing and processor management. Layered above the kernel are programs called servers, such as file control and networking.

By isolating the machine-dependent portions of code within the kernel, hardware-independent versions of Unix — or another operating system such as OS/2 or MVS — can be layered on top. A single Mach kernel could even support multiple native-mode operating systems running simultaneously.

Today's version of Mach, Release 2.5, still contains a generous amount of Berkeley's Unix 4.2 code and some AT&T Unix System V code as well. However, Carnegie Mellon is currently at work systematically

for parallel processing to Mach 2.5 — and is now adding its own enhancements at the rate of $40 million per year. OSF/1 is scheduled for general release late this year.

Ira Goldstein, research vice-president at Cambridge, Mass.-based OSF says OSF/1 will require payment of an AT&T license fee, while OSF/2, due out late in 1992, may not.

OSF/2 will be built around TMach, now being developed by Trusted Information Systems, Inc. in Glenwood, Md., under a contract with DARPA. TMach will be a highly secure version of Mach based on an early version of the Unix-free Mach kernel.

As a practical matter, no version of

How Mach works

To support multiprocessing, Mach uses the concepts of "tasks," or collections of systems resources, and "threads," meaning the basic units of computation. Multiple threads can execute simultaneously within a task, which contains a single virtual address space.

Tasks share results by passing messages through ports or by sharing memory. Mach was designed to send messages to a process on another computer as easily as to another task on the same machine.

Mach employs a flexible approach to memory management in multiprocessor systems that allows the use of shared memory or distributed memory. Mach can also accommodate hybrid systems in which some memory is shared and some is local to specific processors. This allows Mach to be used in shared-memory multiprocessors, such as DEC's VAX; distributed-memory machines, such as BBN Advanced Computers, Inc.'s Butterfly; and in computer networks.

Virtual-memory management is split into machine-dependent and machine-independent portions, which aids portability. According to Richard Rashid, a professor at Carnegie Mellon University who leads the Mach project, the flexibility and power of Mach do not impose a performance penalty. The University of California at Berkeley's Unix 4.3 kernel, which Rashid refers to as a "dumping ground" for every conceivable feature, has been greatly streamlined for Mach. In addition, Mach replaces many of Unix's physical inputs and outputs with in-memory accesses.

For the same machine running the same Unix-based applications, Mach typically shows a 10% to 25% performance advantage over Unix 4.3, Rashid says.

GARY H. ANTHES
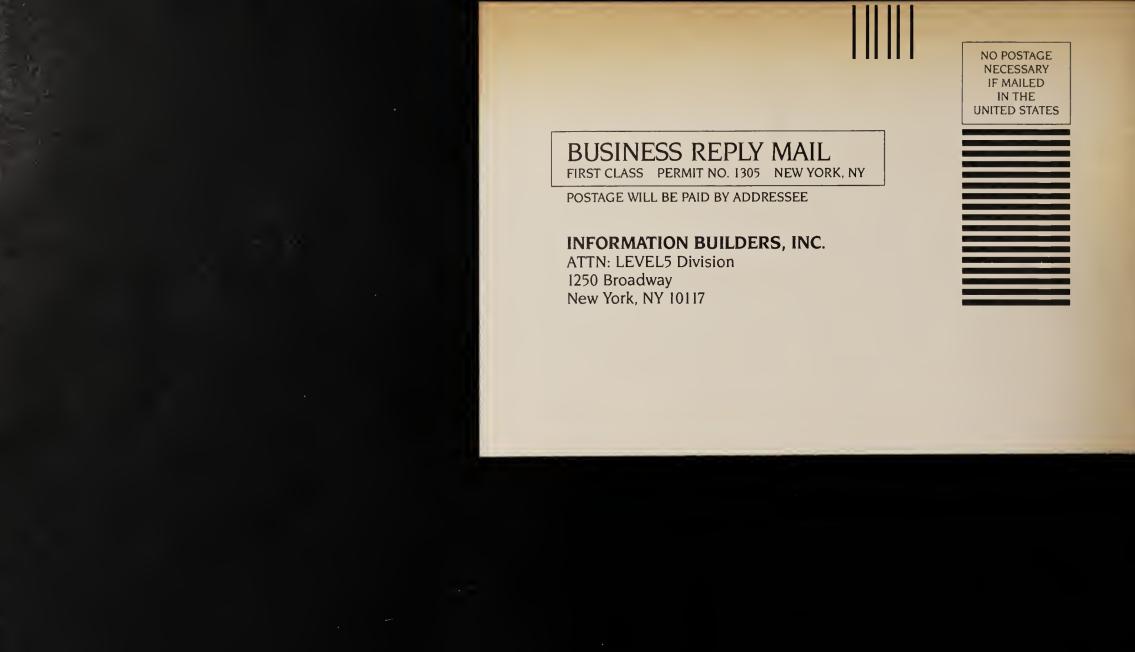
BRING AN EXPERT INTO FOCUS.

INTRODUCING LEVEL5 FOR FOCUS.
THE ONLY 4GL INTEGRATED WITH AN EXPERT SYSTEM.

Now you can meet your company's ever-growing demands for better information with the only proven 4GL to integrate the power of expert systems technology. We call it LEVEL5 for FOCUS. You'll call it The Expert 4GL.

LEVEL5™ for FOCUS is a complete application-development environment that combines 4GL tools and data management with a fully optimized rule-based inferencing system. Now you can create a new generation of FOCUS applications that capture and apply knowledge. The rules and regulations, policies and procedures on which every company relies. You can turn simple decision support into advanced decision management.

FOCUS is proven technology for accessing, manipulating, and storing data. For the first time,

strategic knowledge can be consulted from any of these critical functions from any point in your application. And since you can do this from many applications, you can better address consistency and maintenance across your organization.

It's from Information Builders, so you can apply these unique capabilities to data in every file and database in your IBM or DEC data center including DB2, SQL/DS, IMS, Rdb, DBMS, and RMS.

Only Information Builders provides seemless integration between the most widely used 4GL and the fastest growing expert system to give you The Expert 4GL. Now give your applications the power to deliver the best information. Contact Information Builders, Inc., 1250 Broadway, New York, NY 10001, or call 212-736-4433 ext. 3700.

LEVEL5 for FOCUS

INFORMATION BUILDERS, INC., 1250 BROADWAY, NEW YORK, NY 10001

212-736-4433 Ext. 3700

Pick one thing you want in transaction processing:

1. Fault-tolerant
2. Distributed
3. Integrated

BEG
BORROW
STEAL
SUBSCRIBE

There are four ways to get the latest news in the IS industry hot off the pages of *Computerworld*.

We highly recommend you subscribe. And save the risk of personal embarrassment or possible arrest.

Order now and you'll receive 51 issues packed cover to cover with the most up-to-the-minute information on topics ranging from products and people to trends and technology.

Plus, you'll get our special bonus publication, *The Premier 100*, an annual profile of the top companies using information systems technology.

According to a study conducted by the Adams Company, *Computerworld* is the best-read publication in the industry. And with good reason. It's timely. It's topical. And it's thorough.

So don't get stranded on the bottom of your company's routing slip, while everyone else is using *Computerworld* to climb the corporate ladder.

Use the postage-paid subscription card bound into this issue. And get your own copy of *Computerworld* — without begging, borrowing, or stealing.

COMPUTERWORLD

INSIDE   OS/2, Unix facing net clash   PS/2 tries

The Newsweekly of Information Systems Management

BRIEFS

Return of the Atari kid

Commodore International Ltd. put together a new tag team aimed at developing and marketing interactive, Amiga-based consumer products and went straight to the well to find the man to head it: **Nolan K. Bushnell**, the home computer products pioneer whose resume includes the founding of Atari, Inc. and the creation of the first video game system. Bushnell's official — and freshly minted — title at Commodore will be general manager, consumer interactive products, according to the company.

....

Not 'the Toronto Operations'?
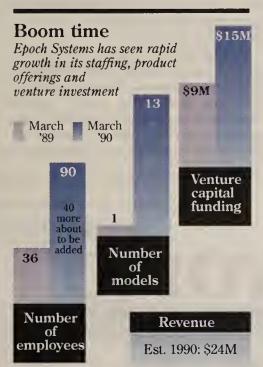
Unix player **The Santa Cruz Operation** is about to acquire 100% of Toronto-based **HCR Corp.**, hailed as Canada's leading Unix supplier, the companies jointly announced last week. The privately held mates-to-be declined to reveal financial terms of the deal beyond stating that it would take place as a "share swap with a multi-million-dollar value." The companies said that when everything is done — pending the final approval of the company's shareholders — HCR will run as an independent subsidiary known as SCO Canada, Inc.

....

Migrating East

Technology and accounting consultancy **Deloitte & Touche** has joined forces with **Migration Technologies, Inc.** in Camarillo, Calif., to provide technology migration services to companies that are moving from one computer vendor to another. Migration Technologies already markets Migration Project Life Cycle, a software tool for planning and executing the transition from one computer platform to another. Financial details of the partnership — which the companies said will be headquartered in New York — have still not been disclosed.

Twin Peaks: Looking good so far

Up-and-comer Epoch taking off

Boom time
Epoch Systems has seen rapid growth in its staffing, product offerings and venture investment

March '89 | March '90

$15M
$9M
13
90
40 more about to be added
1
36

Venture capital funding
Number of models
Number of employees
Revenue
Est. 1990: $24M

CW Chart: John York

BY MARYFRAN JOHNSON
CW STAFF

If Christopher Robert ever feels like gazing into his past, the president and chief executive officer of Epoch Systems, Inc. need only glance out his office window.

Down a sloping, barren hill from Epoch's new Westboro, Mass., headquarters sits Data General Corp., which served as a career breeding ground for Robert and several other top executives at this fast-growing network storage vendor.

Yet no one at Epoch seems to be looking backward these days.

"It's our job to run faster than anyone else," Robert said. "The one thing a company can do wrong is look backward to figure what the other guy is doing."

The 4-year-old firm that appeared to be an up-and-comer last year [CW, March 6, 1989] has grown apace since then. It is currently expanding its 90-person staff by 40 new employees and counting on 1989 sales of $7.7 million to triple this year. Its first foray into Japanese and British markets last year shifted 20% of Epoch's annual sales overseas.

Unlike so many of its Boston-area high-tech neighbors, now suffering slumping fortunes, Epoch is surging ahead with a leading-edge product and free run of its own specialized niche in optical and magnetic disk storage.

John Dunkle, a vice-president at

Network General justifies hype

BY ELISABETH HORWITT
CW STAFF

Network General Corp.'s story reads like a classic Horatio Alger tale. Five years ago, plucky Harry Saal, undaunted by the financial flounderings of his first venture, Nestar Systems, Inc., struck gold with his second by anticipating an explosion in demand for more effective local-area network troubleshooting tools.

Today, Menlo Park, Calif.-based Network General is still riding the crest of that explosion. Fourteen months after the company made what many analysts called the network industry's hottest public offering of the year, its stock has tripled in value.
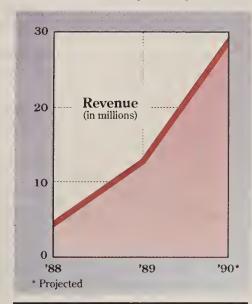
Late last month, Network General, still riding on the rewards of its flagship Sniffer LAN protocol diagnostic system, reported record revenue of $8.8 million for its fiscal-year 1990 fourth quarter — a 119% increase over the same quarter last year. The company's revenue doubled in 1989, and it expects to double it again this year to $29 million, Saal said.

Nor is saturation of Sniffer's market in sight. "There are still thousands of LANs with no tools," Saal said. The need for tools to pinpoint LAN trouble spots, on the other hand, continues unabated. The number of LAN installations is expected to grow 40% per year between 1989 and 1993, a recent report by Arthur D. Little, Inc. said.

On a roll
Network General has more than doubled revenue in each of the past two years

Revenue (in millions)

30
20
10
0
'88 | '89 | '90*
* Projected

Source: Network General Corp. | CW Chart: John York

One roof over competitors' heads?

Novell buys stake in Gupta Technologies, possibly setting the stage for a family feud

BY CHARLES VON SIMSON
CW STAFF

Extending the dense web of alliances in the database server community, Menlo Park, Calif.-based Gupta Technologies, Inc. announced earlier this month that it had sold a 20% share of the company to Novell, Inc. for an undisclosed sum.

Executives of both companies said that the deal simply cements Gupta's commitment to develop database products for Novell's Netware network software. However, if the proposed merger of Novell and Lotus Development Corp. is consummated, it will give the merged company ownership in two competing database companies. Lotus owns a 15% share of Sybase,

Inc. — the developer, along with Microsoft Corp., of the SQL Server database server product that competes directly with Gupta's SQL Base database server. If the merger between Lotus and Novell is finalized as expected, the proposed Gupta deal could set up a competitive environment rife with potential conflict of interest in the database management system market.

Umang Gupta, president and chief executive officer of Gupta Technologies, was adamant that the deal was struck with Novell and not with the firm resulting from the Novell/Lotus merger. "It gives us a technical endorsement and financial backing from Novell," he said. "It is an agreement between us and Novell and not Lotus."

A spokesman for Novell said that until the merger with Lotus is complet-

ed, the company would simply make the best decisions it could as a stand-alone company and that Lotus was in no way involved in the negotiations with Gupta.

Umang Gupta acknowledged the potential for conflict. "Someone will have to figure out whose side everyone else is on," he said. "I am frankly not sure how this will all work out."

A Gupta source close to the deal said that the agreement between Lotus and Novell came after the Novell agreement with Gupta and complicated the process. The source maintained, however, that both sides had the option to back out and chose not to. "For now, we really see it as a formal endorsement of our commitment to Netware," the source said. "The rest will have to wait."

Gephardt decries U.S. lack of industrial policy

BY PETER BARTOLIK
CW STAFF

BOSTON — House Majority Leader Richard Gephardt (D-Mo.) last week called on high-tech executives to become involved in a "giant fight" brewing in Washington, D.C., over development of a national industrial policy.

In a speech to a meeting of the board of directors of the American Electronics Association, Gephardt said an industrial policy is one of the three initiatives needed from government to ensure that U.S. industry is competitive with Japan and a unified Europe at the end of this decade.

The other linchpins of Gephardt's "High Technology Competitive Agenda for the Future" are resolution of the U.S. budget deficit and changing the nation's education system to eliminate the escalating high school dropout rate.

While offering few specifics, the unsuccessful candidate for the 1988 Democratic presidential nomination painted development of an industrial policy as the cornerstone for international competitiveness.

Although " 'industrial policy' are the words no one wants to utter," Gephardt said, "if we don't get one pretty soon, we are likely not to have any industries left that we care about."

The recent ouster of Craig Fields from the position of director of the Defense Advanced Research Projects Agency, or DARPA, [CW, April 30], Gephardt said, "was not because [Fields] didn't do the job right . . . it was because of ideological disagreement within the White House on what he was trying to do."

DARPA has long been involved in nurturing fledgling technologies considered crucial to advanced defense systems. Fields had steered the agency toward "dual-use technologies" that had commercial as well as military potential; he had sponsored the Sematech semiconductor consortium, high-definition television projects and made an unprecedented direct investment last month in a developer of gallium arsenide circuits.

Gephardt invited the electronics executives to become involved in an upcoming battle over a bill crafted by Sen. John Glenn (D-Ohio) to create a "civilian DARPA" — essentially a nonmilitary agency designed to seed technology start-ups in commercially strategic areas. The bill would overhaul the Commerce Department and seek to promote exports.

Decrying Bush administration officials who "do not believe there is any difference between semiconductor chips and potato chips," Gephardt argued that the U.S. has in the past crafted industrial policies that paid off. "We've had an industrial policy in agriculture for 100 years, and it's the reason we have the lowest prices and best quality product in the world," he said.

More immediate, however, is the "budget summit" President Bush has proposed to hold with Congress in a bid to resolve the staggering budget deficit.

While saying he hoped such a summit will be successful, Gephardt offered little optimism. "I'm worried that the well has been poisoned by the political back-and-forth on the tax issues," he said, noting that just days after Bush indicated a willingness to participate in the budget summit, Republican leaders were coming out of the White House saying particular tax issues are not open for debate.

With 85% of the federal budget split between interest payments on the national debt, defense spending and social security outlays, "to think we can do something without revenue is not realistic," Gephardt said.

On the issue of a capital-gains tax break — an issue dear to many of the executives Gephardt was addressing last week — the democratic congressman held out a very tenuous offer, hinting that it might be considered if the tax rate for high-income taxpayers is raised to at least match that of middle-income earners.

EXECUTIVE CORNER
Telebit founder honored by IEEE

Modem supplier **Telebit Corp.** recently honored its founder, packet-switching pioneer **Paul Baran**, by electing him chairman. In October, he is scheduled to receive the Institute of Electrical and Electronics Engineers' 1990 Alexander Graham Bell Medal for "exceptional contributions to the advancement of communications sciences and engineering."

Northern Telecom Ltd. Chief Executive Officer **Paul G. Stern** is now the $6.1 billion telecommunications company's chairman. The former Unisys Corp. president, who took over the helm of Northern Telecom in March, 1989, replaces **Edmund B. Fitzgerald**, who will remain a member of the board.

Coopers & Lybrand has appointed **Dean P. Bouloukos** as partner in charge of the information technology practice in its Chicago office. Bouloukos was previously a partner at Ernst & Young.

Epoch

Workgroup Technologies in Hampton, N.H., said Epoch has kept this storage niche to itself because no other company offers an optical disc server as a stand-alone component. Major systems vendors such as Digital Equipment Corp. are promoting optical technology only as part of much larger systems.

"I think they have a lot of blue sky ahead of them," said Jay Bretzmann, an analyst at International Data Corp. in Framingham, Mass. "There's nobody who comes close to offering the price per megabyte and the performance level Epoch does."

Bretzmann pointed out, however, that since the Epoch-1 Infinite Storage Server began shipping only 16 months ago, the company "hasn't had that much time or that many products to do too many things wrong."

Designed to satisfy the ever-expanding storage needs of Unix-based workstation users, Epoch's data servers provide fast on-line access to high-capacity disk storage over an Ethernet network. The bulk of its 60 accounts are at firms with Sun Microsystems, Inc. installations of more than 30 workstations.

Customers said the beauty of the system, with its embedded software automatically managing disk space, is its invisibility. All data appears to be on-line, and storage capacity seems unlimited.

One premier customer is GTE Directories Corp. in Dallas/Fort Worth. The telephone directory publisher, which distributes more than 1,100 directories worldwide, installed a 30G-byte Epoch-1 in January 1989 to clear up the storage bottleneck caused by the hundreds of thousands of display ads created each year on its network of 100 Sun-3 workstations.

Last summer, GTE added four more Epoch servers for its regional centers in Florida, Washington state and California. "We've reduced the time needed to retrieve a data file from hours or days to 15 or 20 seconds," said Bob Ohnstad, production staff director at GTE.

Epoch's hierarchical storage system, which recently expanded beyond Unix workstations to offer compatibility with DEC's VAX/VMS, combines the speed of magnetic disk drives with the voluminous capacity of erasable optical discs stacked in a jukebox, according to the company.

Epoch's biggest challenge now will be "filtering its technology down" to more traditional commercial clients in the Fortune 100, Dunkle said.

Epoch stands apart from the crowd of disk drive vendors as a cheaper alternative to a spreading farm of Winchester disks. Its $4 to $5 cost per megabyte contrasts starkly with the $45-per-megabyte cost of storage on a Sun-4 workstation, for example.

The company now offers 13 different models in a range of subsystems that are priced from $61,000 to $694,000, including entry-level systems, 5¼-in. rewritable optical disc servers and 5¼- and 12-in. write-once read-many optical disc servers.

"The other thing driving demand [for Epoch's offerings] is the big push to get rid of paper," Robert said. "I really believe the file cabinet in the corner will die with the right technology, and that technology is optical storage."

With an eye toward sharpening the firm's sales and marketing organization, Epoch co-founder and DG veteran Kenneth Holberger four months ago left his CEO post to become chairman of the board.

New CEO Robert's management background includes field operations at Lexidata Corp., plus a decade of product marketing and sales at DG. In 1983, he co-founded Corporate Software, Inc. in Westwood, Mass., and helped build it into a $134 million public company.

"I checked this company out very carefully, and I liked the visionary strategies," Robert said. "I also liked the fact that customers were saying the product was even better than they expected."

Epoch's Robert *researched the firm*

Stella Johnson

Net General

"The need for [LAN diagnostic products] is growing partly because people are becoming more LAN-conscious but more because of the increasing LAN complexities," said Richard Segal, a technical adviser at Aetna Life and Casualty Co. and a Sniffer user. "People are mixing and matching Ethernet and Token-Ring, one person's LAN software, another's network driver, and the more stuff [from different vendors] you put in the box, the more fingers start pointing," Segal said. "Sniffer, the old wolfhound," can discover the guilty party.

While both Hewlett-Packard Co. and Excelan, Inc. — now a subsidiary of Novell, Inc., which itself was recently acquired by Lotus Development Corp. — had introduced LAN diagnostic products prior to Network General, Sniffer rapidly established itself as a "Cadillac in the business" because of its rich array of features and broad support of networking protocols, said Alice Bradie, a principal at Hambrecht & Quist, Inc.

Saal determined that Sniffer would be protocol-independent — a lesson learned from Nestar, which based its LANs on Arcnet and then watched Ethernet and token-ring take off.

Indeed, independence has been a keynote of Network General's success. While the firm has completed several OEM deals in which vendors such as Data General Corp. resell Sniffer to their customers, Network General has remained aloof from the recent rash of acquisitions in the networking industry.

Mergers such as 3Com Corp.'s acquisition of Bridge Communications and Novell's acquisition of Network General competitor Excelan have resulted in "a lot of good people leaving," Saal said. "If that's the industry trend, we'll go upstream."

Network General could be at a turning point right now as a result of its recent first major introduction since Sniffer — a low-end, easy-to-use LAN monitoring tool called Watchdog, Saal indicated. While Sniffer is geared to the more sophisticated analysis needs of the upper 5% to 10% of large corporations, Watchdog potentially addresses the much broader market of small to medium-size LAN installations that cannot afford to employ the network expertise needed to operate Sniffer, he added.

Watchdog will actually become an intrinsic part of the next Sniffer release, Saal said. However, the low-end system's appeal may be limited to new customers, given that Sniffer users may not see much need for Watchdog's simpler monitoring capabilities.

Paul Hastings Janofsky & Walker, for instance, has been very happy with Sniffer's "ability to do both general and in-depth analysis" as well as diagnose problems across a system that combines Novell's Netware, Xerox Network Systems and X.25, said Steve Hauberg, the Los Angeles law firm's data processing manager.

However, Paul Hastings sees no need to install Watchdog because "you give people the most complete tool you can give them," Hauberg said.

3Com hones in on Asian LAN market

BY JIM NASH
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. officials are moving aggressively to capitalize on a local-area network market they plan to dominate: Asia.

"Asia is an absolutely humongous marketplace," said Eric Benhamou, president of 3Com. It is a marketplace Benhamou said he intends to command.

"We have landed," he said. "Our Far Eastern operations are in full expansion."

Benhamou said he foresees Japanese revenue reaching 10% of all company revenue by the mid-1990s. Half of 3Com's current business in Japan consists of terminal-to-host LANs, said Robert Freeman, 3Com's manager in Japan.

Asian connections

Benhamou explained that 3Com, which has done business in Asia since 1983, opened a regional office in Taipei, Taiwan, this month and will follow that up with another office next month in Singapore. 3Com already has a regional office established in Hong Kong.
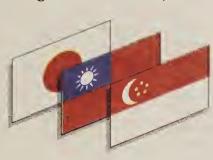
3Com's Asian initiative is drawing skepticism from some quarters. Nina Burns, a principal at Menlo Park, Calif., market research firm Network Management Solutions, said 3Com is "running with the pack" as it races to Asia. The company's success, Burns said, more likely will come from its products and interoperability overtures than from geographical moves.

For 3Com, which has all but surrendered the domestic market for network operating systems to Novell, Inc., turning to Asia presents a second chance to battle nose-to-nose with the personal computer LAN giant.

"In the U.S.," Benhamou said, "we [3Com and Novell] enjoy a very cooperative attitude." Outside the U.S., he continued, the reigning mode is marketing Darwinism.

In Japan, 3Com looks fit enough to take on Novell, which announced a Japanese joint venture earlier this year. Freeman said that NEC Corp., Hitachi Ltd. and Fujitsu Ltd. have all declared LAN Manager as their strategic PC networking product.

NEC alone boasts 60% of the Japanese PC market, according to Benhamou. Furthermore, Nippon Telegraph & Telephone Corp. (NTT) currently distributes 3Com's 3+Open.

Freeman also pointed out that moving into Asia presents a more level playing field, one that is largely free of Novell's almost monolithic U.S. presence.

Rick Kimball, an analyst at Montgomery Securities, said "from a running start, there's no reason why 3Com won't do very well" in competition with Novell.

The best 3Com could hope for out of such a situation, Kimball added, "would probably be more of an even match."

The networking company formally announced the shipment of its Japanese language (Kanji) network operating system, 3+Open Kanji. Japan-based NTT and Nippon Electric Co. already have installed the PC software.

In the native tongue

The 3Com offering is the first Kanji network operating system on the market, according to Freeman. Written in Kanji, the system will also accept key English phrases that in some cases are difficult to translate. 3+Open Kanji does not translate the two languages. Transmission Control Protocol/Internet Protocol and Open Systems Interconnect versions will be shipped later this year, Freeman said.

The software was developed by 3Com/Soliton, a 1-year-old joint venture between 3Com and Soliton Systems K.K., a Tokyo-based networking company.

The product announcement comes at a time when many wide- and local-area network companies are stretching beyond U.S. shores. All face formidable cultural problems, Freeman said.

Japan, for all its technological brilliance, has shied away from the individualistic nature of PCs, according to industry observers. The Japanese use roughly four million PCs, compared with the U.S.' 40 million, Benhamou stated.

Sequel shapes storage support

BY J. A. SAVAGE
CW STAFF

SANTA CLARA, Calif. — Mainframe storage vendors today are faced with a dilemma. On one hand, they do not want to use up precious resources supporting dying technologies, and direct-access storage devices that use 14-in. platters certainly qualify for the rest home. On the other hand, there is an installed base that still needs support.

Sequel, Inc., a five-month-old spin-off from Unisys Corp., hopes to exploit that dilemma by taking the hardware remanufacturing out of the hands of vendors. Sequel started out with a contract to remanufacture Unisys' 14-in. disk drives. Last month, it expanded its scope by buying the high-end storage assets of Priam Corp.

Reaching for the brass ring

Sequel is also discussing remanufacturing contracts with "every other" 14-in. storage vendor, according to Marketing Vice-President Robert Hubbard. The entire market for repairs for 14- and 8-in. disk drives, he said, is about $2 billion.

With the contract from Unisys and with Priam's old customers, Hubbard estimated Sequel's current share of that market to be 7% to 8%.

"With companies like Digital [Equipment Corp.], they hate like hell to spend money on repairs; they want to spend it on new products," said Jim Porter, president of Disk/Trend, Inc., a market research firm in Mountain View, Calif. Porter said that Sequel has a shot at the market, although it is not a sure shot because vendors do maintain a "certain pride in ownership."

"Their story is believable," he said, estimating that Sequel has a solid three- to four-year business opportunity. "But as 14-in. drives begin to look like pterodactyls, they'll have to shrink."

Sequel does remanufacture 8-in. disks and drives — about 40 per day, compared with 110 14-in. drives, according to Hubbard. The company also makes about 30 5¼-in. drives per day, as a result of the Priam acquisition.

Hubbard estimated that Sequel has the capacity to make 200 per day each of 14- and 8-in. drives and another 300 of the 5¼-in. size.

Sequel is the only mainframe-oriented company of its kind because it has the "sophisticated" clean rooms necessary to carry out the processes, Porter said. Other storage remanufacturing companies exist, he said, but at the low end of the niche.

Those companies are "independents," Hubbard said, who reverse-engineer the drives. Sequel gets the necessary engineering information direct from the vendor.

To train in Spain can be a real pain

BY CHRISTINE SIMONNET
SPECIAL TO CW

With the 1992 Summer Olympic Games in Barcelona and the World's Fair in Seville, the end of the 20th century is witnessing the beginning of a Spanish commercial rebirth. Spain's businesses are now attempting to make up for lost time before the unified European market of 1993.

Finding the work force to staff the slew of new jobs, however, is proving to be difficult. "In Spain, there are many students with a degree from the Faculty of Arts, but we don't need this type of qualified work force," said Avelino Rodriguez, general secretary of the Franco-Spanish Chamber of Commerce. "We badly need engineers and data processing professionals."

However, many of the "help wanted" signs — two firms alone are reportedly looking for over 50,000 qualified people — are remaining in place.

Foreign exchange

Even on a small scale, there are already Franco-Spanish exchanges between students, teachers and research workers. Some agreements between schools enable young engineers to study for six months at a French or Spanish school or spend their last year of study in either country.
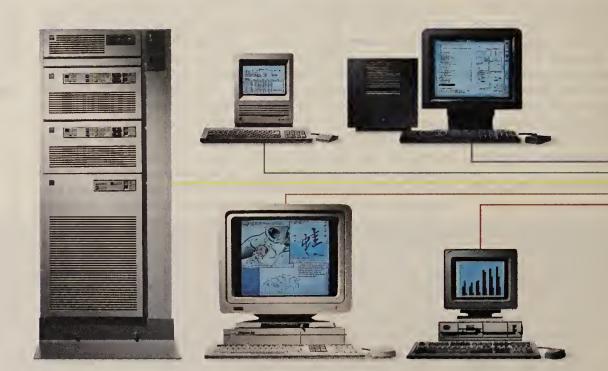
However, it is difficult, if not impossible, for a young French engineer to go to Spain as a trainee.

"Companies think they are wasting time training young people without being sure that they will stay in the country," said Maria Pasual, a student at the Telecoms Superior School in Madrid.

"Moreover, the Spanish government does not authorize this practice since they consider it disguised work," Pasual added. "Spanish students can only hold part-time jobs — 500 hours per year — if they want to have a little experience before their first job."

In addition, Spanish government regulations make it difficult to be hired by a Spanish firm; labor laws are still very protectionist. Any firm willing to hire a foreigner must first go to the National Institute for Employment (NIEM). If NIEM does not match the job profile with the profile of an unemployed Spanish worker, the request is accepted.

NET posts $2.5M income drop

BY JIM NASH
CW STAFF

REDWOOD CITY, Calif. — An overzealous sales office is being blamed for disappointing year-end financial figures at data communications vendor Network Equipment Technologies, Inc.

Net income for the fiscal year ended March 31 was down $2.5 million from last year's total of $16 million, according to the company.

NET executives revised their unaudited second- and third-quarter financial figures after external auditors discovered exaggerated revenue. According to information released to the press, a September 1989 shipment worth about $519,000 was listed as a booked deal, when it was not. That amount was erased from revenue statistics in the audit.

Revenue for the third quarter, originally stated at $52.1 million, was decreased by $5.4 million after a series of accounting errors — some traced back to the September mishaps — was discovered, according to company documents.

About $2.4 million of the $5.4 million was recovered through proper order documentation and reported in the fourth quarter.

As a result, NET Chief Executive Officer Bruce Smith said in a prepared statement, management foresees the company operating at break-even or perhaps even a small loss in the near term.

A little too aggressive

Company spokesman Stan DeVaughn said the problems stemmed from "a little too much aggressiveness" on the part of a handful of Eastern region salesmen, all of whom have since left NET.

"We have precise processing policies about when an order is considered an order, a shipment is a shipment, and when revenue is booked as revenue, and these policies were not followed," DeVaughn said.

DeVaughn said a new vice-president of sales, Craig Tysdale, had been appointed in the incident's aftermath. Tysdale, NET's vice-president of marketing since 1989, replaced Roger Hobbs. The company did not comment on whether Hobbs' departure is related to the recent mishaps.

The appointment, however, apparently has not dispelled investors' misgivings. NET's stock price plummeted to 10¾ by the middle of last week after a 52-week high of 34⅜.

INTERNATIONAL BRIEFS

DEC to the defense

Where does a government contractor turn in a time of increasing peace and shrinking Defense Department budgets? **Digital Equipment Corp.** has an answer: to one of the defense departments still very much on active alert. DEC and Tel Aviv-based **Israel Aircraft Industries** — said to be Israel's largest manufacturing company — recently announced a strategic alliance under which DEC will serve as a systems integrator for its Israeli partner. Israel Aircraft, in turn, will standardize its computer-aided design, manufacturing and engineering efforts on DEC workstations to the tune of an estimated $25 million over the next five years.

. . . .

Piece of the Apricot

Late May is the slated date for final contracts embodying the acquisition of UK-based **Apricot Computers PLC's** hardware division by Tokyo-based Mitsubishi Electric Corp. The deal will create a new Mitsubishi subsidiary called Apricot Computers Ltd.; the former Apricot will continue its remaining software service business under the name of ART Group.

. . . .

Help!

That, along with inventory management software, is what users in the UK want the most, according to information released by three large UK-based information center software providers. The burgeoning number of large commercial users craving software "Help desk" and inventory control packages leads them to estimate a $1.6 million market niche by the end of this year, the companies' report said.

. . . .

Equita-Bull?

Bull H. N. Information Systems, Inc. is set to pay $376,350 for a 40% stake in **Bridge Pacific**, a networking specialist and computer dealer based in Auckland, New Zealand. According to one Bridge executive, negotiations between the two companies have been off-again, on-again for some 15 months. A recent slew of telecommunications contracts garnered by Bridge, he said, flipped the switch to on again.

COMPUTER CAREERS

Strolling down Wall Street

Securities firms are hiring, but their needs are limited and specialized

BY DAVID A. LUDLUM
CW STAFF

Despite what you may have heard, it's neither the best of times nor the worst of times for information systems people on Wall Street. Although some big investment houses have been laying off workers, business and hiring continue to chug along, but the pace is nothing like the breakneck rate typical of the '80s.

True, demand for some investment banking and brokerage services has slowed, and profit margins in others are under pressure. Both developments are forcing firms to cut back on spending. However, the situation also means the firms must compete more aggressively as new business opportunities arise (see story page 75).

In addition, the companies must replace computer systems that have been made nearly obsolete by globalization and other changes in the securities business. Firms must also integrate their existing systems so that management can keep real-time tabs on all the operations.

As recent earnings statements make clear, some firms are in a better position than others to hire new employees to deal with these challenges.

Firms with narrowly-focused strategies tend to be financially stable, while those with the broadest array of services have taken the biggest losses. "We're still recruiting," says Rick Adam, partner in charge of global operations and information technology at Goldman, Sachs & Co. "There's still plenty of opportunity. I think people who read the press have a much darker view of the conditions than what's really going on here."

On the other hand, firms such as Merrill Lynch & Co. and Shearson Lehman Hutton, Inc. are methodically shrinking their work forces. Even so, Merrill Lynch, which took a $470 million restructuring charge late last year, is hiring IS people, says Jeff Berg, manager of applications services. He declined to provide a number.

Jay Gaines, an executive recruiter in New York who places top IS managers on Wall Street, says he sees no lack of opportunity. However, he says people can no longer merely ride the explosive growth as some did during the 1980s. "Career progress will probably be less dramatic, more parallel to industrial companies or banks," Gaines says.

Among senior managers, the great demand is for people with a demonstrated ability to cut costs, increase productivity and manage the accompanying organizational change, according to Gaines. "When you're looking at individuals, you look at what they accomplished with the resources they had and how well and how efficiently," he says. "There are people who have successfully streamlined organizations while maintaining or enhancing productivity."

Imagination is another important attribute, says Howard Sorgen, director of information processing and technical services at Merrill Lynch. Managers must consider unconventional approaches to cutting costs, such as outsourcing and partnerships with suppliers and other companies. "It's a different type of thinking — creative rather than quantitative," he says.

In the technical ranks, the most sought-after people are the ones who can help companies deploy the distributed processing that can help securities traders and other revenue generators analyze markets more quickly, managers and recruiters say.

This priority calls for professionals skilled in C programming and high-end, multitasking personal computers or Unix workstations with graphical, windows-based interfaces.

Relational databases are another important component of the distributed approach. They also relate to a second critical

While the chances of landing a choice position or moving up in the securities industry ranks are not as great as in recent years, observers say that pay for the people who do get the opportunities will remain healthy.

Wall Street will continue to boast many of the highest-paid

> THE GREAT demand is for people with a demonstrated ability to cut costs, increase productivity and manage the accompanying organizational change.

technological thrust at securities firms — the streamlining and modernization of software development. Companies are standardizing data structures and application interfaces to eliminate redundancies and to allow programs to be integrated.

Merrill Lynch is moving toward a more specialized division of labor in application development, Berg says. Increasingly, the work is divided among technical specialists who provide development tools and business-oriented people who ferret out requirements and define software functions.

The latter group must understand what users need from applications and translate it into software, using a limited set of high-level tools. "You have to know the users' business almost as well as he does — you're the person recommending improvements to it," Berg says.

IS positions, some of them with seven-figure compensation. Further down in the organization, senior applications programmers can still earn $60,000 to $80,000 per year, and project managers can earn $125,000 to $200,000.

If the pay does not return to the extravagant levels it occasionally reached in the 1980s, the pressure may not be as great either.

"Wall Street was paying incredibly well in terms of DP, but people were working incredibly long hours," says Jessica Keyes, a consultant and former managing director of technology at the New York Stock Exchange. "In return for that money, the firm had some expectations. It expected seven days a week. It expected blood."

Ludlum is a Computerworld senior writer.

Big Apple has a few bruises

High cost of living, crime are driving IS jobs to suburbs

BY KIM NASH
CW STAFF

New York is a happening place. Business professionals are enticed by the sheer volume of the city's career opportunities and by its reputation for being just a step ahead of the rest of the world.

Information systems organizations anchored here mirror that chic, fast-paced image. "That saying, 'If you can make it here, you'll make it anywhere,' is the same for IS professionals," says Peter Fiorillo, president of executive recruiting firm Robert Half International/Accountemps, Inc.

What information systems people seek and find in the New York area are stable companies that offer advanced technology and good compensation.

But there are cracks in the facade. The city's high cost of living, overcrowding and crime are deterrents to a lot of people. To avoid them, many urban professionals seek refuge in suburban homes, generally in Westchester County, Long Island, Northern New Jersey and Connecticut's Fairfield County.

What is good for workers is also good for business. In recent years, there has been a push by some New York-based corporations to relocate data centers and other facilities to these less costly and less cramped locales.

Outside the city, the greatest demand for IS people is in Bergen and Passaic counties in New Jersey, where major insurance companies and accounting and law firms have moved programming operations, Fiorillo says.

Long Island is another region bursting with new installations. B. Dalton Book-

Nash is a *Computerworld* researcher, features.

seller, Inc., the book retailer, is moving there and looking for computer people, according to Fiorillo.

While programmers can work in the suburbs, higher level IS executives generally continue to commute into the city because they report to the top headquarters people who work there. The potentially long commute from an attractive suburb is one of the issues they tackle when considering a job in New York, says Norm Sanders, managing director of Russell Reynolds and Associates, Inc., a New York-based executive recruiting organization.

One of the major attractions of working in the New York area is the healthy salary levels (see chart this page). "If you're good, you can make more money here than anywhere else," Fiorillo says.

In addition, organizations in the region are often among the first to explore emerging technologies such as imaging, transaction processing and local-area networking, Sanders says.

The New York Transit Authority, for example, is piloting imaging projects, says Bill Heuser, the authority's vice-president of information services.

Heuser says his department needs people with experience in personal computer-based development languages and databases. "We've never had to go out and hire people like that before," he says.

Sanders and Fiorillo say that experience with local-area networks is also a valuable asset on an applicant's resume.

In the management ranks, the transit authority and other organizations are emphasizing the alignment of information systems with business strategy. "In the past year, we've moved to a structure geared toward the overall corporate management of information resources," Heuser says. Two assistant vice-presidents in

IS handle strategic planning issues, while two others oversee tactical, day-to-day concerns in operations, communications and applications development.

Transportation is no different from other industries when it comes to IS structure, he says. As a result, Heuser

competes heavily with other industries for quality staff. "We're all out there looking for good members in areas like mainframe applications, communications and local-area networking," he says.

Research and statistics compiled by CW features copy editor Cathleen Duffy.

regional scope

Metropolitan New York

Unemployment rate Metropolitan New York
(NYC, Long Island, Northern N.J., Stomford, Conn. orea)
(In thousands)

1988 — 4.1%
1989 — 5.1%

Source: N.Y. Department of Labor, Research and Statistics

Average housing costs
(In thousands)

1988 — $183.8
1989 — $183.2

Source: National Association of Realtors
Weighted for population of multiple metropolitan areas

Largest employers:
(By number of employees)

- City of New York
- New York City Board of Education
- New York Transit Authority
- New York City Health and Hospital Corporation
- Citibank
- New York Telephone
- Chase Manhattan Bank
- New York City Housing Authority
- Manufacturers Hanover

Source: N.Y. Department of Labor, Research and Statistics

Salary averages

Systems ond programming monoger

1988 — $52,756
1989 — $66,750

Senior programmer/analyst

1988 — $38,250
1989 — $42,549

Junior programmer

1988 — $25,014
1989 — $27,118

Source: 1988, 1989 CW salary surveys
CW Chart: Tom Monahan

COMPUTER PROFESSIONALS

COAST TO COAST

F-o-r-t-u-n-e

IS CLOSER THAN YOU THINK

F-o-r-t-u-n-e Personnel Consultants is one of the largest national networks of independently owned and operated offices specializing in the placement of Computer Professionals in all areas including Sales and Marketing. We understand your needs and can help you find the position to enhance your career or the people to fill your company openings.

Coast-to-coast we're closer than you think. To reach our entire netowrk, write to us at 655 Third Ave., Dept. CW; New York, NY 10017 and we will forward your resume for confidential consideration or call us **TOLL FREE** for a specialist serving your area of interest.

1-800-221-4864
or
212-697-4314
in NY State

F-o-r-t-u-n-e®
Personnel Consultants

DBA · Sr. P/A
IBM Mainframe—MVS/XA

NPA, a leading specialist firm in the administration and control of benefit plans for Rx drugs, vision care, eligibility systems and data services, utilizes state-of-the-art systems to service our clients' diverse needs. Due to continuing growth, we are seeking candidates for two newly-created positions;

1) A skilled Data Base Administrator with a minimum of 6 months Data Base Administration experience utilizing IDMS, and (2) a Senior Programmer/Analyst with COBOL experience (will train individual with strong IDMS or CICS). Both positions require 3-10 years experience in an MVS/XA environment.

NPA offers a technically advanced environment, and outstanding professional and managerial career challenge. We have a sustained record of stability and growth, and a strong reputation for successful and innovative management. A highly competitive compensation package, including a superior benefits program, is offered. Please send resume and salary requirement, in confidence, to:

Laura A. Baron, AVP—Human Resources
National Prescription Administrators, Inc.
P.O. Box 2187, Clifton, NJ 07015

NPA NATIONAL PRESCRIPTION ADMINISTRATORS INC

Equal Opportunity Employer

EXPERIENCED IN
ADABAS / NATURAL II?

Then you have a great future to look forward to with Turn-Key Solutions, a dynamic computer consulting and management company with a long and distinguished list of clients.

The continually growing demand for our expert services, has created long- and short-term Assignments and Opportunities throughout the country. Flexible hours are available. Degree preferred, but we will consider comparable experience.

We offer an excellent, highly competitive compensation and benefits package. For prompt consideration, please forward your resume to or call:

MIKE SULLIVAN
1-800-275-6612

TURN-KEY SOLUTIONS, INC.
15 Maiden Lane, Suite 805
New York, N.Y. 10038
FAX: 212-619-5047

An Equal Opportunity Employer M/F
(Sponsorship Available)

Turn-Key Solutions, Inc.

CONSULTING OPPORTUNITIES
Branch Managers, Sales, Recruiters

5 year old regional information technology company is planning rapid expansion via merger, acquisition and/or new branch start up. Seeking highly motivated entrepreneurial individuals to join fast growing team. Current locations: N.Y., Ohio, Florida and Virginia.

Principals/Experienced Computer Consulting Industry inquires ONLY.

James P. Growney, President
C.P.U. Incorporated
345 Woodcliff Drive
Fairport, NY 14450

FAX: 716-385-7918 OFC: 716-385-7710

CPU

An Information Technology Company

Information Technology Professionals

A major prestigious and respected global investment banking firm on Wall Street, Goldman, Sachs & Co., offers exceptional career opportunities in New York, London, and Tokyo to experienced Information Technology Professionals.

We have several immediate openings for experienced Information Technologists in Systems Development, Telecommunicatons and Technical Operations world-wide. We are also seeking professionals for our Training and Support staff roles.

We offer two state-of-the-art Systems Development environments: Our IBM mainframe environment using COBOL Language, DB2 and CASE Tools and our microcomputer development environment using C Language with DOS Windows, OS/2 Presentation Manager, and UNIX with MOTIF. Knowledge of brokerage is a definite plus.

We emphasize a participative environment. Your ability to work in a team environment and communicate effectively are critical success factors.

All these opportunities offer excellent salaries and benefits. To apply, please send your resume, in confidence, to: **Personnel Department, RB. Goldman, Sachs & Co., 85 Broad Street, (7H/6), New York, NY 10004.** We are an equal opportunity employer, M/F.

Goldman Sachs

St. John's University
Neu York

The largest private Catholic University in the U.S. seeks qualified and motivated individuals for its administrative computing department.

TECHNICAL SUPPORT ANALYST
Aid and assist Director of Technical Services in providing computer systems software and Datacomm support for multiple campus facilities. Candidates must have 3-5 years experience in a Bull-HN GCOS environment.

PROGRAMMER ANALYST (2)
Working with Mgr. of Systems and Programming will be responsible for enhancing and maintaining administrative systems in COBOL DMIV Bull-HN.

All positions offered require a minimum of undergraduate degree.

Forward resume and salary requirements to:

St. John's University
University Administrative Computer Ctr.
Queens Campus
Jamaica, N.Y. 11439

St. John's University is an Equal Opportunity Employer.

MAJOR FINANCIAL CONGLOMERATE
With Worldwide Installations Needs

2 VAX Systems Programmers
DECNET a must

2 Burroughs ALGOL
Application & Technical Support

1 UNIX/C/SYBASE
Applications Development

Call Bob Winns

Exec-computer
A Division of Omnicomputer, Inc.
1440 Broadway, New York, NY 10018, (212) 944-9230

SERVING NEW YORK METRO AREA SINCE 1977

COMPUTER SPECIALISTS ... OUR ONLY SPECIALTY

Experienced in Eng'r'g or Programming? We match you to the job *you* want. All USA Locations/All fees paid. Mail resume or call to discuss your career goals

TECH SUPPORT
IBM & DEC
SOFTWARE
C UNIX Assemblers
PROG/ANALYSTS
IBM M Frame & Minis
CICS RPG COBOL Databases
HARDWARE
Analog/Digital
COMMUNICATIONS
Voice & Data

HAMILTON
TECHNICAL PERSONNEL, INC
P.O. Box 369
West Hurley, N.Y. 12491
(914) 679-4050

RECRUIT ONLY THE BEST!

Place your ad in regional or national editions of Computerworld's Computer Careers section. For more information, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

TECHNICAL ANALYST

Responsibilities include monitoring equip. capacity and utilization and aiding Technical Support Services in evaluating the need for equip. upgrades and configuration changes; exposure to capacity planning and DASD management is desired. The ability to analyze, determine and solve technical problems encountered in daily operation of the data center is required. Requires exp. in large IBM Mainframe environment including MVS, SAS, COBOL, CICS, DMS or DFHSM, NCP, NCCF, TSO, and OMEGAMON. Salary to $40K. Contact JIM BOSTIC, PHILLIPS RESOURCE GROUP, P.O. Box 5864, Greenville, SC 29606 or call 803/271-6350 (D), 803/292-1181 (E), or 803/271-8499 (FAX).

COMPUTER PROFESSIONALS

Progressive and growing leader in the software services industry has current needs for full time and contract consulting staff in N.C., S.C., and Florida. Excellent salary and benefits package including medical, dental, life coverage, and incentive bonus. Positions require two or more years experience in any of the following areas:

- COBOL, CICS, TSO
- IMS DB/DC
- ADABAS/NATURAL
- VAX, INGRES
- APPL/FACTORY
- HOGAN, BANKING
- Mc & DODGE
- IBM AS/400
- DB2
- IDMS/ADSO
- CICS, MVS/XA
- VAX, ORACLE
- VAX, RDB
- CREDIT CARD
- HP-3000, IMAGE
- POWERHOUSE

Send resume in complete confidence to:

SOFTWARE Data Services, Inc.

4651 Charlotte Park Drive, Suite 100
Charlotte, N.C. 28217

H/W & S/W ENGINEERS
PROGRAMMER/ANALYST
SYSTEMS PROGRAMMERS
TECH WRITERS

- OS2, Present. Mgr.
- IBM PS2, "C", INTEL
- UNIX/AIX INTERNALS
- PROGRESS, UNIX
- APL, MARKETING
- ORACLE/INFORMIX
- RAMIS/FOCUS
- CLIPPER/UNIX
- AS/400 - COBOL or RPG
- ADA w/ MIL STND 2167A
- JD EDWARDS
- M&D Millennium
- REXX/EXEC2
- Nuclear S/W Tech Writer
- DB2 Architect w/CICS
- DB2 w/ CSP
- SQL/DS w/ ISPF Intern.
- INGRES DBA
- MOD 204
- CICS/IMS DB/DC

4401 W. Tradewinds Ave #303
Ft. Lauderdale, FL 33308
(305) 776-5300
Fax (305) 776-5328

TheExperts
"It takes one to know one"

University of Alaska, Statewide Administration
University of Alaska Computer Network
(UACN), Fairbanks

POSITION: **Production Control Technician III, FULL-TIME PERMANENT**

SALARY: D.O.E. plus excellent benefits (relocation expenses not provided)

CLOSING DATE: June 15, 1990

JOB SUMMARY: Schedule/setup and monitor data processing for the University of Alaska's test, quality assurance and production administrative applications. Maintain production/operations software packages.

MINIMUM QUALIFICATIONS: At least 3 years knowledge of batch systems, production control and operations environments, job control language, general computer concepts and terminology, file handling, data security, text editing, and utilities. Experience with CA7 Automated Production Control software and CA1 tape management system software preferred.

TO APPLY: Submit a current resume and the name of three references to:

University of Alaska Computer Network
John Butrovich Bldg.
910 Yukon Drive, Suite 206C
Fairbanks, AK 99775-5180
ATTN: VI Mullen

THE UNIVERSITY OF ALASKA IS AN EO/AA EMPLOYER AND EDUCATIONAL INSTITUTION. PERSONS HIRED BY THE UNIVERSITY OF ALASKA MUST COMPLY WITH PROVISIONS OF THE FEDERAL IMMIGRATION AND CONTROL ACT OF 1986 AND ARE EXPECTED TO POSSESS A VALID SOCIAL SECURITY NUMBER.

COMPUTER CAREERS

Outsourcing: Avoiding pitfalls

Be sure your contract addresses key areas like growth and new technology

BY RAYMOND T. NIMMER
SPECIAL TO CW

Tighter budgets, better technology and widespread publicity have stoked interest in outsourcing to an all-time high. Although companies for years have had the choice of handling their data processing internally or farming it out, today, the issue is on the minds of more managers than ever.

Although outsourcing has been around for a while, purchasing the services can be a tricky business. Some of the rules just call for common sense. But outsourcing is in some ways a unique undertaking, so successful buyers need to pay close attention to the issues it entails.

The most basic question that organizations need to ask is: "Should I outsource at all?" Unfortunately, many firms decide to outsource when they need a comprehensive upgrade of their hardware. As a result, they view outsourcing simply as a capital investment issue. The question becomes: "Should I spend the resources — perhaps several million dollars — to create and maintain an in-house system, or should I shift that cost to the outside party?"

There is no general answer to this question. Arriving at the correct solution requires an examination of a company's unique characteristics, including its human resources and technological infrastructure. Even if an organization eventually decides against outsourcing, simply undertaking this kind of probing investigation can be beneficial because it can generate insights regarding these critical aspects of the business.

Companies that do opt to outsource must face a number of critical decisions about how to protect themselves in the joint venture. That's right — joint venture. In an outsourcing relationship, the customer enters into a long-term partnership with the service provider. As in many joint ventures, poor performance on the part of the provider might cause the client company to fail.

For big organizations, the typical outsourcing contract covers a lengthy period of time — usually 10 years. While this arrangement lets the service provider amortize the cost of its computer systems, it also means that the client is bound to a partner for what seems like eternity in the fast-changing information systems business.

Besides the length of the relationships, the raw material involved, information, also makes outsourcing contracts unusual. These two components mean that contracts must thoroughly address some key areas. They include the following:

• **Growth.** The relationship needs to provide for the possibility that the client's needs will grow substantially. For example, if an organization adds a new division, the client should know if the service provider can or will expand its facilities to meet the new needs. Managers need to look closely at a prospective service provider and satisfy themselves that it can meet their future requirements.

• **Revisions.** Companies entering outsourcing relationships need to establish what rights they have to bring some or all of the processing back in-house without terminating the contract or paying a stiff penalty.

• **Security.** The outsourcing relationship must make explicit provisions for maintaining the confidentiality and integrity of the data. The firm must ensure that the service provider won't share critical data or let other parties gain access to it. Organizations need to ask what standards of security the contract imposes on the service provider.

A **LTHOUGH OUTSOURCING** has been around for a while, purchasing the services can be a tricky business.

• **Reliability.** Firms must make sure they are dealing with a stable partner and that they maintain continued access to their information if the service provider encounters financial problems during the course of their relationship. Thus, the outsourcing contract must stipulate how the client can access, retrieve or transfer its data if the provider closes or goes into bankruptcy.

• **Accountability.** Contracts should spell out which party is responsible for errors or information that is lost in the course of processing. Under what circumstances is each party responsible? How broad is the party's responsibility? What measures must the service provider take to ensure the security and integrity of data? What amount of insurance must the provider maintain against the risk of information losses?

• **Technology.** Given their length, outsourcing contracts must also include provisions that state the service provider will use up-to-date systems. Firms must ask what rights they have to influence the development of the service provider's system.

Stipulations in this area should deal not only with developments in technology but also with the process of choosing which system the service provider will operate five or six years down the road.

Nimmer is Foundation Professor of Law at the University of Houston, counsel to the law firm Sheinfeld, Maley & Kay and author of *The Law of Computer Technology* (Warren, Gorham & Lamont, New York).

CLASSIFIED

The BoCoEx index on used computers
Closing prices report for the week ending May 4, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	$400	$660	$250
XT Model 086	$500	$700	$350
XT Model 089	$600	$700	$500
AT Model 099	$1,150	$1,375	$745
AT Model 239	$1,200	$1,700	$1,200
AT Model 339	$1,370	$1,400	$1,000
PS/2 Model 50	$2,060	$2,200	$2,000
PS/2 Model 60	$2,060	$2,200	$2,000
Compaq Portable II	$1,475	$1,725	$1,400
Portable III	$2,300	$2,500	$1,900
Portable 286	$1,700	$2,000	$1,700
Plus	$750	$950	$675
Deskpro	$825	$900	$800
Deskpro 286	$1,400	$1,625	$1,300
Deskpro 386/16	$2,500	$2,750	$2,475
Apple Macintosh 512	$450	$550	$450
512E	$450	$450	$350
Plus	$1,050	$1,200	$1,000
II	$3,300	$3,500	$3,050

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

TRANSING

Newsletters as training tools

They can refresh, update or cajole, but they call for a disciplined approach

BY JESSICA KEYES
SPECIAL TO CW

In the world of information systems training, a newsletter can be worth a thousand follow-up training sessions.

IS training organizations usually have only a day or two to teach people how to use a particular piece of software or hardware. During this short period of time, the instructor tries to convey a wealth of knowledge. The problem is that students generally retain only a small percentage of what they hear or read. This fact accounts for the high proportion of students who retake courses, presumably to "refresh" their memories.

Even when trainers successfully drive home principles and students actively use their newfound knowledge, the instructor often finds that there is some follow-up information to impart. There is often a need to update lessons. Instructors can forget to make a point or run out of time before covering all of their material.

Finally, there is the problem of students who take courses but eventually lose interest in the subject. It's particularly common with topics that generate a lot of attention, such as fourth-generation languages. Students may not find the time to use what they've learned and may need some prodding to do so.

How, then, can IS training organizations perform the following tasks?

• Reinforce classroom training?
• Keep students informed about new features and functions?
• Keep students interested in using the tools they've labored to equip them with?

A newsletter could be the answer. A newsletter can develop a loyal following, whether it is for useful information or simply chatty commentary. Whatever the reason, good newsletters are often read from front to back. To generate this kind of loyal readership, however, a newsletter publisher must follow certain rules. Among them are the following:

• **Publish regularly.** If readers are going to take a newsletter seriously, the publisher must demonstrate that he takes them seriously. That means the newsletter arrives on time, all the time. Otherwise, readers won't be able to depend on it, especially for timely announcements.

• **Run repeating columns.** Regular columns are another

means of building reader loyalty. Covering a topic in a regular place and with a consistent format helps readers find information that is helpful to them. For microcomputer users, columns might include a Lotus macro of the month, a spreadsheet newswatch, word processing tips or new Dbase applications.

• **Target a specific audience.**

Will the newsletter be geared to end users or IS staff members? Will it cover only personal computer training or will it deal with systems built in-house? Too broad a scope will prevent a newsletter from conveying a personal touch. Worse, by trying to satisfy too many readers it can end up satisfying none.

• **Keep it short.** A big advantage of newsletters is that readers can peruse them during spare moments in almost any situation. They might take in an issue while waiting in line or riding the bus or train.

• **Make it interactive.** To get readers more involved, newsletters can ask them to respond to surveys. Another interactive approach is asking them to try particular software programs and write back about their experiences. Innovative publishers issue disks containing the text of articles or let readers download macros and other programs.

• **Make it fun to read.** Manuals are not fun to read. The notes from your latest course are probably not fun to read. But a newsletter can and should be fun to read. It might include contests, cartoons, jokes and other humorous items. Try to imagine a publication that you would enjoy reading — then create it.

• **Welcome outside contribu-**

tors. Seeing your newsletter become popular enough that managers or readers want to contribute to it is a sign of success. Readers should value these contributions if writers prepare the pieces thoughtfully; people love to know what their peers are doing, and they like hearing it directly from the horse's mouth. A good way to start in this direction is to encourage or even solicit letters to the editor.

A newsletter is the one training vehicle that can go anywhere and be read anytime. It reinforces prior training, provides new ideas and encourages feedback and sharing. It's also something that people can enjoy.

Today, there are many desktop publishing packages on the market that are easy and quick to use. With them, publishers can achieve near-typeset quality for less than $500.

Even without this specialized software, training organizations can produce great newsletters using word processing. The most important thing is publishing the material your readers want. Who says training has to end when students leave the class?

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

ADVERTISERS INDEX

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

STOCK TRADING INDEX

Indexes	Last Week	This Week
Communications	112.3	112.3
Computer Systems	77.9	80.2
Software & DP Services	117.5	120.6
Semiconductors	55.9	57.8
Peripherals & Subsystems	81.0	83.9
Leasing Companies	89.2	86.8
Composite Index	83.5	84.8
S&P 500 Index	141.0	144.5

Communications

Computer Systems

Software & DP Services

Semiconductors

Peripherals & Subsystems

Leasing Companies

CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MAY 9, 1990

EXCH		52-WEEK RANGE		PRICE CLOSE MAY 9, 1990	WEEK NET CHNGE	WEEK PCT CHNGE

Communications and Network Services

N	AMERICAN INFO TECHS CORP	68	55	61	1.0	1.7
Q	ANDREW CORP	26	20	23.5	1.0	4.4
Q	ARTEL COMM CORP	10	4	6.25	0.5	8.7
N	AT&T	47	34	40.5	0.4	0.9
Q	AVANTEK INC	7	2	3	-0.1	-4.0
N	AYDIN CORP	21	14	14.625	-0.4	-2.5
N	BELL ATLANTIC CORP	57	40	49.75	2.4	5.0
N	BELLSOUTH CORP	59	45	55	1.1	2.1
Q	COMPRESSION LABS INC	15	6	11.875	-0.5	-4.0
Q	CONTEL CORP	37	23	25	-1.0	-3.8
Q	DATA SWITCH CORP	5	2	2.125	-0.1	-5.6
Q	DIGITAL COMM ASSOC	25	17	20.75	0.6	3.1
Q	DYNATECH CORP	21	15	15	0.0	0.0
Q	FIBRONICS INTNL INC	8	4	6.875	-0.1	-1.8
Q	GANDALF TECHNOLOGIES	7	2	3	0.5	20.0
N	GENERAL DATACOMM INOS	7	3	3.375	-0.1	-3.6
N	GTE CORP	72	50	64.25	3.4	5.5
Q	INFOTRON SYS CORP	13	4	4.25	0.5	13.3
N	ITT CORP	65	51	52.75	0.8	1.4
Q	M A COM INC	9	3	4	0.4	10.3
Q	MCI COMMUNICATIONS CORP	49	31	38.625	2.6	7.3
N	NETWORK EQUIP TECH INC	34	9	10.75	-0.6	-5.5
Q	NETWORK SYS CORP	13	7	12	0.0	0.0
N	NORTHERN TELECOM LTD	26	17	24.875	1.0	4.2
Q	NOVELL INC	45	24	38	0.0	0.0
N	NYNEX CORP	92	72	82.875	1.9	2.3
N	PACIFIC TELESIS GROUP	52	38	44.25	1.5	3.5
A	PENRIL CORP	7	4	6.375	-1.0	-13.6
N	SCIENTIFIC ATLANTA INC	25	17	22.75	-0.5	-2.2
N	SOUTHWESTERN BELL CORP	65	48	56.125	1.9	3.5
Q	3 COM CORP	29	10	11.75	-0.4	-3.1
N	U S WEST INC	41	32	36.875	-34.8	-48.5

Computer Systems

Q	ALLIANT COMPUTER SYS	8	4	6.25	-0.6	-9.1
Q	ALPHA MICROSYSTEMS	8	3	3.313	-0.1	-1.8
Q	ALTOS COMPUTER SYS	8	5	5.625	-0.6	-10.0
A	AMDAHL CORP	23	11	14.125	0.8	5.6
Q	APPLE COMPUTER INC	50	32	41.875	2.1	5.3
Q	AST RESH INC	24	7	23	1.5	7.0
N	BOLT BERANEK & NEWMAN	9	4	4.25	0.1	3.0
N	COMPAQ COMPUTER CORP	113	73	106.125	6.6	6.7
N	COMMODORE INTNL	19	6	7.375	0.9	13.5
N	CONTROL DATA CORP	23	16	18.75	0.4	2.0
Q	CONVEX COMPUTER CORP	16	12	14.875	0.0	0.0
N	CRAY RESH INC	57	31	46	3.8	8.9
Q	DAISY SYS CORP	5	0	0.563	0.1	12.6
N	DATA GEN CORP	19	8	9.125	0.4	4.3
N	DATAPOINT CORP	6	2	3	0.1	4.3
Q	DELL COMPUTER CORP	9	5	9	0.5	5.9
N	DIGITAL EQUIP CORP	103	70	87.75	4.0	4.8
N	FLOATING POINT SYS INC	4	0	1	0.0	0.0
N	HARRIS CORP	40	28	32.5	2.4	7.9
N	HEWLETT PACKARD CO	58	40	44.875	0.5	1.1
N	HONEYWELL INC	95	73	94.875	6.5	7.4
N	IBM	119	93	111.25	2.1	1.9
Q	INFORMATION INTNL INC	16	12	11.875	0.4	3.3
Q	IPL SYS INC	14	5	9.5	0.8	8.6
N	MAI BASIC FOUR INC	8	2	2.625	0.1	5.0
N	MATSUSHITA ELEC INDL LTD	184	123	143	4.8	3.4
Q	MENTOR GRAPHICS CORP	24	14	23.25	0.8	3.3
N	N8I INC	3	0	0.281	0.0	0.0
N	NCR CORP	72	53	67.875	1.8	2.6
Q	PYRAMID TECHNOLOGY	33	9	29.5	-1.8	-5.6
Q	SEQUENT COMP SYS INC	28	11	26.5	0.0	0.0
Q	SHAREBASE CORP	3	0	0.438	0.0	0.0
N	SUN MICROSYSTEM INC	28	13	28.375	3.9	15.8
Q	SYMBOLICS INC	2	0	0.563	0.1	12.6
N	TANDEM COMPUTERS INC	30	16	25.5	-0.1	-0.5
N	TANDY CORP	49	30	31.75	-0.1	-0.4
N	ULTIMATE CORP	12	5	6	0.8	14.3
N	UNISYS CORP	28	12	14	-0.9	-5.9
A	WANG LABS INC	9	4	4.25	-0.4	-8.1

Software & DP Services

Q	AMERICAN MGMT SYS INC	16	11	13.75	0.3	1.9
Q	AMERICAN SOFTWARE INC	24	14	20.5	1.8	9.3
Q	ANACOMP INC	8	3	3.375	0.4	12.5
Q	ANALYSTS INTL CORP	20	13	18.25	0.0	0.0
Q	ASHTON TATE	24	9	11.25	0.1	1.1
Q	ASK COMPUTER SYS INC	16	7	8.125	0.1	1.6
N	AUTO DATA PROCESSING	55	38	53.625	1.9	3.6
Q	AUTODESK INC	50	33	47.75	3.0	6.7
N	BMC SOFTWARE INC	26	12	23.25	2.3	10.7
N	BUSINESSLAND INC	14	7	8.75	0.0	0.0
Q	COGNOS INC	7	4	7.125	0.6	9.6
N	COMPUTER ASSOC INTNL INC	22	11	14.75	1.4	10.3
Q	COMPUTER HORIZONS CORP	14	7	12.5	-0.5	-3.8
N	COMPUTER SCIENCES CORP	59	40	44.75	-0.8	-1.6
Q	COMPUTER TASK GROUP INC	15	9	10.625	-0.3	-2.3
Q	COMSHARE INC	44	28	39.75	-1.8	-4.2
N	CORPORATE SOFTWARE	16	8	13.625	1.6	13.5
N	GENERAL MTRS (CLS E)	34	24	33.5	2.9	9.4
Q	HOGAN SYS INC	7	4	3.875	-0.1	-3.1
Q	INFORMIX CORP	17	8	13.25	0.9	7.1
Q	INTELLICORP INC	7	3	6.125	0.4	6.5
N	LEGENT CORP	32	19	23	-0.5	-2.1
Q	LOTUS OEV CORP	38	21	32.75	0.3	0.8
Q	MICROSOFT CORP	66	26	62.75	4.5	7.7
N	NATIONAL DATA CORP	35	22	22.5	-1.3	-5.3
N	ON LINE SOFTWARE INTL INC	11	6	7.625	-0.1	-1.6
Q	ORACLE SYS CORP	28	13	18.125	2.3	14.2
N	PANSOPHIC SYS INC	19	10	11.375	0.3	2.2
Q	PHOENIX TECHNOLOGIES INC	15	2	2.875	-0.1	-4.2
Q	POLICY MGMT SYS CORP	38	28	36.25	2.0	5.8
Q	PROGRAMMING & SYS INC	23	16	22	1.0	4.8
Q	RELATIONAL TECH INC	11	5	7.75	0.0	0.0
N	REYNOLDS & REYNOLDS CO	34	19	21.125	0.5	2.4
N	SAGE SOFTWARE INC	14	7	13.75	1.0	7.8
Q	SEI CORP	20	15	19.75	0.0	0.0
Q	SHARED MED SYS CORP	19	12	12.375	-0.1	-1.0
Q	SOFTWARE PUBG CORP	25	13	22.875	0.6	2.8
Q	SUNGARD DATA SYS INC	26	13	18.75	-1.0	-5.1
Q	SYSTEMATICS INC	44	30	40.75	-0.1	-0.3
N	SYSTEM CENTER INC	26	17	20.125	1.3	6.6
N	SYS. SOFT INC	29	13	22.25	0.3	1.1
Q	WORDSTAR	3	1	1	-0.1	-11.1

Semiconductors

N	ADV MICRO DEVICES INC	11	7	9	0.4	4.3
N	ANALOG DEVICES INC	12	7	7.25	0.4	5.5
Q	ANALOGIC CORP	11	9	9.875	0.1	1.3
Q	CHIPS & TECHNOLOGIES INC	26	15	18.75	0.8	4.2
N	INTEL CORP	44	28	43.25	3.0	7.5
Q	MICRON TECHNOLOGY INC	26	7	13.625	0.5	3.8
N	MOTOROLA INC	73	47	72.625	1.1	1.6
N	NATL SEMICONDUCTOR	9	5	7.25	0.1	1.8
N	TEXAS INSTRS INC	47	28	35.625	1.1	3.3
A	WESTERN DIGITAL CORP	13	6	12	0.4	3.2

Peripherals

Q	ALLOY COMP	3	0	0.594	-0.5	-44.1
N	AM INTL INC	6	2	2.375	0.1	5.6
N	AUTO TROL TECH CORP	6	2	2.938	0.2	6.8
Q	BANCTEC INC	20	11	17.75	0.3	1.4
A	COGNITRONICS CORP	8	3	4.625	0.5	12.1
Q	CONNER PERIPHERALS	22	10	21.25	1.6	8.3
N	DATAPROOUCTS CORP	16	5	9.75	0.0	0.0
A	DATARAM CORP	15	8	14.625	0.1	0.9
N	EASTMAN KODAK CO	52	36	38.125	0.3	0.7
N	E M C CORP MASS	7	3	5.875	0.8	14.6
Q	EMULEX CORP	11	4	5.375	0.3	4.9
N	EVANS & SUTHERLAND	33	17	30.625	-0.9	-2.8
Q	ICOT CORP	3	1	1.313	-0.1	-4.5
N	INTERLEAF INC	9	5	6.375	0.8	13.3
Q	IOMEGA CORP	8	2	3.875	0.0	0.0
Q	LEE DATA CORP	4	1	1.375	-0.1	-8.3
Q	MASSTOR SYS CORP	4	1	1.313	0.1	5.0
N	MAXTOR CORP	15	7	15.125	2.0	15.2
Q	MICROPOLIS CORP	7	3	5.063	0.2	3.9
N	MINNESOTA MNG & MFG CO	85	68	81.875	2.9	3.6
Q	PERSONAL COMP PRODUCTS INC	5	4	4.063	-0.2	-4.4
N	PRINTRONIX INC	12	7	12	0.4	3.2
N	QMS INC	16	8	15.375	0.4	2.5
Q	QUANTUM CORP	17	7	16.5	0.8	4.8
N	RECOGNITION EQUIP INC	13	5	5.25	0.1	1.2
Q	REXON INC	9	6	8.75	0.1	1.4
N	SEAGATE TECHNOLOGY	20	10	12.25	-0.1	-1.0
N	STORAGE TECH CORP	28	9	25.625	-0.4	-1.4
N	TANDON CORP	2	0	2	-0.1	-5.9
N	TEKTRONIX INC	24	13	13.125	0.0	0.0
N	TELEVIDEO SYS INC	1	0	0.25	0.1	33.0
N	XEROX CORP	69	46	48.25	1.5	3.2

Leasing Companies

Q	AMPLICON INC	17	7	8	-0.8	-8.6
N	CAPITAL ASSOC INTNL INC	8	3	3.125	-0.4	-10.7
Q	COMOISCO INC	34	17	18	0.0	0.0
Q	CONTINENTAL INFO SYS	1	0	0.25	0.0	-11.0
N	LDI CORPORATION	18	13	15.5	0.5	3.3
N	PHOENIX AMERN INC	5	3	3.375	0.0	0.0
Q	SELECTERM INC	9	6	5.75	0.1	2.2

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL

Chips ahoy

Semiconductor makers ride a wave of optimistic numbers

New orders plus new chip equals new stock price high. That's the equation that added up to positive numbers for Motorola, Inc. last week. After reports of brisk April orders and a speedy new chip slated to be introduced today, the semiconductor maker's stock gained 4 points to close at 74⅝ Thursday. Intel Corp. seemed to benefit from the same formula: Its stock advanced 1¼ points to 43½, after the firm said its April orders also increased.

Technology stocks apparently lured investors last week, although a few issues did lose ground. Among the good buys was Sun Microsystems, Inc.; heavy trading boosted its price 2½ points to 28⅛. Compaq Computer Corp. jumped 3¼ points to 107. IBM added 1⅞ to 112⅜, and Hewlett-Packard Co. garnered 1½ points to end at 46¼. On the downside, Unisys Corp. lost 1½ points to 13¾ after news that the leader of its mainframe division, Hollis Caswell, will retire. Digital Equipment Corp. eased ¼ of a point to 87¾. Teradata Corp. fell 1⅜ to 25¼.

Elsewhere, MCI Communications Corp. announced a dividend payment plan, and its shares edged up ¾ of a point to 38⅝. AT&T also rang up stock sales this week, up ⅞ to 41¼.

KIM S. NASH

NEWS SHORTS

Unisys reorganizes

Unisys Corp. realigned its computer and networking businesses late last week, combining the two into a single unit called the Computer Systems Product Group. The new division will integrate the products from the former $1.5 billion Network Computing Group, based in San Jose, Calif., and the $3 billion Computer Systems Group, based in Blue Bell, Pa. Cyril Yansouni, 47, who had been president of the Network Computing Group, was named president of the new division and executive vice-president of the corporation. Yansouni was president of Convergent Technologies, Inc. when Unisys acquired it in 1988. The moves came after Hollis Caswell, 58, president of the Computer Systems Group, resigned to become chairman at Hypres, Inc., an Elmsford, N.Y., semiconductor firm.

. . . .

EDS parks in Chicago

Scofflaws in the Loop, beware! Electronic Data Systems Corp. last week received a tentative nod from Chicago city fathers to engineer a parking violations system featuring handheld computers and image processing technologies. Chicago's computerized parking ticket system, with its backlog of hundreds of thousands of overdue tickets, has been plagued by problems that four firms have tried to fix over the years.

. . . .

Livermore looks at paperless world

Is it possible that, in another five years, paperwork will be almost a thing of the past for companies that do business with the U.S. Department of Defense? That's what scientists at the Lawrence Livermore Laboratory in Livermore, Calif., said. They have created a Unix-based software system that can electronically handle nearly all the paperwork that needs to be completed by government contractors. Plans call for the Defense Department to begin pilot testing of the Electronic Commerce Through Electronic Data Interchange program in 1991.

. . . .

Bellcore tests smart card

An experimental "smart" card for telephone users was unveiled last week by Bellcore, the research and development arm of the seven regional Bell holding companies. The card, now in testing with several hundred Bellsouth Corp. and Bell Atlantic Corp. customers in nine states, contains a microchip that can store 50 telephone numbers and can work with some 200 specially adapted public pay telephones in airports and railway stations. Bellcore plans to publish results of the trial later this year.

. . . .

Consortium signs for Tariff 12

American Business Network, a consortium of 66 corporations, will take advantage of the volume discounts for inbound and outbound long-distance service negotiated under a Tariff 12 contract last week between AT&T and EDS, according to M&SD Network Services, Inc. in Lyndhurst, N.J., an EDS subsidiary that is the managing partner of the consortium.

. . . .

NSF stays with just four centers

Thomas A. Weber, director of the National Science Foundation's (NSF) Division of Advanced Scientific Computing, said last week that the NSF has no plan to replace the John von Neumann National Supercomputer Center at Princeton University on the NSF list of supercomputer centers. The Princeton facility, one of five funded largely by the NSF, lost its funding when Control Data Corp. pulled the plug on supercomputer subsidiary ETA Systems, Inc. last year.

. . . .

Charging into outsourcing

Duracell, Inc. outsourced its computer operations to Pittsburgh-based Genix Enterprises in a five-year, $11 million deal. Bethel, Conn.-based Duracell will eliminate 12 data center operations positions but will keep its own applications development, applications maintenance and management support. Genix will provide mainframe processing, systems software, data storage and data communications.

Consumer

FROM PAGE 1

President Bush. For example, she said, most consumers do not realize that the surveys at the bottom of warranty-registration cards and data from "frequent shopper" programs are turned into databases for use in highly targeted marketing campaigns [CW, March 5].

Credit bureaus have also hopped on the bandwagon, selling the names and addresses of people with certain financial profiles to companies offering credit cards by mail. Guiton said she is concerned about the practice because information provided for credit purposes is being used for a different purpose without the consumer's knowledge.

The bipartisan complaints are reaching sympathetic legislators at the state and federal levels. Already this year, New York and Maryland have passed laws that prevent merchants from forcing consumers to write telephone numbers and addresses on credit-card slips. (The data was captured for mailing lists.)

Privvy privacy

A 1989 public opinion poll by Cambridge Reports, a polling firm in Cambridge, Mass., found that most Americans are concerned about privacy, and 50% support stronger privacy laws.

"These results make it clear that any business involved even indirectly in handling information on individuals must be very sensitive to people's need to feel their privacy is both respected and protected. In some cases, a company or organization could even use its willingness to protect privacy as an effective way of differentiating itself from competitors," the pollster's report said.

Several experts said the privacy issue has flared because of a confluence of factors, including the pervasiveness of telemarketing, junk mail and the controversy over Caller ID telephone services that display the caller's phone number [CW, Feb. 5].

The House Subcommittee on Consumer Affairs and Coinage, chaired by Rep. Richard H. Lehman (D-Calif.), is scheduled to begin marking up a bill next month that makes several pro-consumer amendments to the Fair Credit Reporting Act.

Among other things, the bill would prohibit credit bureaus from providing information for marketing campaigns unless the individual consumers are notified and have the option to decline participation.

The industry opposes many of the bill's provisions as too burdensome. "Credit bureaus should be able to sell mailing lists just like magazines and trade associations and country clubs do," said Marvin Kaplan, spokesman for Associated Credit Bureaus.

The industry does support tougher enforcement and penalties for those who illegally disclose or obtain personal credit information. Currently, the penalties are so minor — up to one year in jail and a $5,000 fine — that most district attorneys will not prosecute, industry officials said.

The New York-based Direct Marketing Association, keenly aware of the privacy issue, has a system permitting consumers to remove their names from telemarketing and mailing lists. At the same time, the industry continues to collect more and more information about people and their buying habits.

Guiton said her philosophy is that, at a time when personal information has become a commodity that is bought and sold for a profit, "we must always be searching for that critical balance between the consumer's need for privacy and industry's need for information."

At Issue: PRIVACY

Rights for modern times

White House advisor Bonnie Guiton offers five basic guidelines to protecting consumer privacy

1. Tell consumers up front and in simple language why certain information is being collected, what it is going to be used for and who will be able to see it

2. Collect only information that is relevant to the transaction at hand

3. Allow consumers to opt out of any marketing or other program involving personal information

4. Show consumers their records upon request and make it quick and easy for them to correct errors and add explanations

5. Make a general concerted effort to educate consumers about how information concerning them is collected and used in today's marketplace

Source: U.S. Office of Consumer Affairs   CW Chart: John York

Taking privacy to the public

Bonnie Guiton, the president's consumer adviser for the past 12 months, has taken the lead role in the Bush administration on privacy issues, making numerous speeches to business and consumer groups and urging Congress to update the 20-year-old Fair Credit Reporting Act.

Guiton's primary message is that the industry needs to do a better job of educating consumers about business databases and develop voluntary industry guidelines to protect consumer privacy. She has also warned the industry that if self-regulation fails, Congress will step in.

In a recent speech, she advised that "there are a bunch of bills out there just waiting for an event or issue big enough to yank them out of the legislative quagmire and give them the attention they need to pass Congress."

Guiton is the first official of the executive branch since the Carter administration to take such a high-profile role on privacy issues. "It's one of those welcome surprises. So far, I'd say it's a four-star performance," said Evan Hendricks, editor of the "Privacy Times" newsletter in Washington, D.C. Guiton has also gained the respect of industry lobbyists, although they do not agree on every issue. Guiton and her staff have done their homework and made an effort to understand the credit industry, said Steve Fier, director of government relations at Associated Credit Bureaus, a Houston trade association.

However, the industry is more comfortable when Guiton talks about industry soul-searching than when she talks about legislative mandates, Fier added.

Guiton's support for congressional action adds some clout to the privacy movement, privacy advocates said.

MITCH BETTS

Guiton: *Industry must educate consumers*

Morris sentence spurs debate

BY MICHAEL ALEXANDER
CW STAFF

Attorneys for convicted computer worm programmer Robert T. Morris filed a notice of appeal in federal district court in Syracuse, N.Y., last week amid debate about the adequacy of computer crime laws and whether his sentence was severe enough.

Morris, 25, was convicted in January of releasing a worm program that hampered university and other computers on Internet, a national computer network, in November 1988.
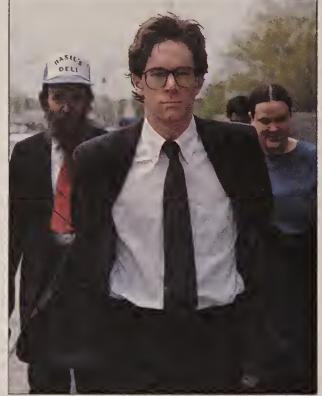
On May 4, the court sentenced Morris to three years of probation, 400 hours of community service and a $10,000 fine. He was also ordered to pay $91 per month — the cost of his supervision during probation.

Immediately after sentencing, defense attorneys said that while they believed the sentence was reasonable and fair, they would appeal in an attempt to remove the lifelong stigma of a felony conviction.

Convicted felons are barred from voting, holding certain jobs and getting contracts from the federal government, among oth-

er "collateral consequences," defense attorney Thomas Guidoboni said last week.

Some legal experts said the sentence and subsequent appeal will probably spur debate on federal sentencing guidelines as they apply to computer crimes

Bob Mahoney

Morris penalty *spotlights statute woes*

and renew calls to strengthen the Computer Fraud and Abuse Act of 1986, the act under which Morris was prosecuted.

A mandatory or harsher sentence should have been applied, said David Newman Jr., an attorney and associate professor at

George Washington University in Washington, D.C. "It was too light," he said. The economic damage, which witnesses collectively testified was greater than $150,000, warranted a jail sentence, he added.

Federal sentencing guidelines did not apply neatly to this case, a fact noted by U.S. District Judge Howard Munson as well as prosecutors and defense attorneys before the sentencing.

Federal guidelines are based on a system that assigns and subtracts points to circumstances surrounding a crime. Points are added for crimes that require special skills but subtracted if the defendant willingly accepts responsibility.

Federal judges are obliged to follow the guidelines in most instances but can depart from the rules in special cases, which Munson did in the Morris case. The crime did not fit within the guidelines, and there were no analogous crimes that might have suggested appropriate punishment, he said before sentencing.

Had Munson followed the guidelines, Morris would have faced 21 to 27 months in prison.

"The Morris case also underscores the need to clarify the fed-

eral statute," said Joseph Tompkins, partner in the Washington, D.C., law office of Sidley & Austin and chairman of the American Bar Association's Criminal Justice Section's Task Force on Computer Crime.

"The problem is that the law is vague and subject to attack, as in the Morris case," Tompkins said. "You spend a lot of time fighting motions of ambiguity of the law. If the law was clear, a lot of those issues would go away, and you could focus on what the facts are. You have to draw the line somewhere and then decide whether he crossed the line.

Right now, we are trying to put the line somewhere."

A report on the Internet incident to the House Subcommittee on Telecommunications and Finance in June 1989 noted that the computer act does not define such terms as "access," "information" and "prevents authorized use for example." Further, the law is not directed at incidents involving viruses, worms and other crimes involving computers, the report said.

There are at least four pieces of new legislation that would patch some of those loopholes in the law, Tompkins said.

'Hacker wanted'

Part of the federal sentence handed down May 4 to Robert T. Morris was that he must perform 400 hours of community service.

Defense attorney Thomas Guidoboni said he hoped Morris would be allowed to apply his computer skills in fulfilling the community service obligation. He said Morris has had several offers for community service work, including one from the chief justice of the West Virginia Supreme Court, who wants Morris to program a computer system that would speed processing of child support claims.

The chief federal probation officer in Albany, N.Y., will determine the nature of community service that Morris is to perform and how that obligation will be carried out, although Morris will probably suggest several alternatives, Guidoboni said.

U.S. District Judge Howard Munson ordered Morris to pay the $10,000 fine within one year. Morris is consulting with the probation officer on when he must satisfy his community service obligation and when he will be able to seek full-time employment to earn income to pay the fine.

Whether he will have difficulty finding a job in the computer industry is unknown. "I think that a lot of companies would hire [Morris] for his programming skills, but others won't because of the felony conviction or concern that some people would not do business with them for hiring Robert," Guidoboni said.

MICHAEL ALEXANDER

Secret Service busts alleged crime ring

BY MICHAEL ALEXANDER
CW STAFF

PHOENIX — More than 150 special agents of the U.S. Secret Service, teaming with state and local law enforcers, fanned out last week to carry out the largest crackdown ever on computer hackers.

Working under the name "Operation Sundevil," the law enforcers executed 28 search warrants in New York, Chicago, Los Angeles, Phoenix and 10 other cities throughout the country in an effort to break up an alleged crime ring that one official said could account for $50 million in damages.

The raids produced a haul of 42 computers and more than 23,000 floppy disks as well as telephone testing equipment and computer printouts. Four suspects were arrested, although

two were nabbed for weapons and drug possession charges, not for crimes related to the investigation.

Agents arrested Andrea Gerulis, 19, in Pittsburgh and charged her with theft of services, unauthorized use of a computer and fraudulent use of credit cards, according to the Secret Service.

Anthony Neusall, 20, was arrested in Tucson, Ariz., and charged with fraudulent schemes, possession of an interception device and theft of services, according to Gail Thackery, assistant attorney general for Arizona.

The investigation was launched nearly two years ago following a "colossal wave of complaints" by businesses and other organizations whose information systems had been under repeated attack, Thackery said. Law enforcement officials said

the investigation was aimed at hackers who steal and illegally use long-distance telephone services, voice-mail systems and credit-card numbers.

Authorities set up a sting operation to snare the hackers, Thackery said. She declined to describe how the sting operated or where it was located, but it appears that an electronic bulletin board was part of the plan.

The search warrants were sealed because the investigation is continuing, said Richard Adams, a Secret Service spokesman in Washington, D.C. He declined to provide additional details of the case.

In a press release issued by the U.S. attorney's office in Arizona, however, U.S. Attorney Stephen McNamee said the improper and illegal use of computers may become the white-collar crime of the 1990s.

"This criminal case may account for losses of over $50 million in 14 cities," U.S. Senator Dennis DeConcini (D-Ariz.) said in a statement related to Operation Sundevil.

Estimates are that computer and credit-card fraud make up a $5 billion-per-year criminal enterprise, he added.

New IBM PS/2 misses its mark — by a school yard

BY RICHARD PASTORE
CW STAFF

IBM introduced another Personal System/2 Model 25 last week aimed primarily at the education market, but academic computing managers said IBM missed the mark with this particular volley.

The Model 25 286 is based on Intel Corp.'s 80286 chip and ships with an IBM Video Graphics Array color monitor. It offers 512K bytes of memory, a 1.44M-byte floppy disk drive and a 20M- or 30M-byte hard disk drive option. List pricing ranges from $2,295 to $2,995.

"It's pretty hard to justify $3,000 when I can get an Epson 386SX with a 30M-byte hard drive and a decent monitor [discounted] for $1,500," said Ronald Jones, director of data processing at Paul Smith's College in Paul Smiths, N.Y.

"The price is too high, but I'd

take a long look at it if they gave us a good discount," echoed Edwin Ecker, director of computer facilities at MacMurray College in Jacksonville, Ill.

IBM may have also underestimated the processing needs of larger schools. "It sounds like a nice machine, but it's too low end," said Raymond Geitka, director of computing services at the University of Michigan at Dearborn.

California State University has also standardized on Intel's 80386SX processor. "Since we're buying comparably configured 386SX machines for a comparable price, I think we'll continue to do that," said Paul Tumolo, director of academic computing.

Both Geitka and Tumolo added that the PS/2 might be suitable for home use by students who do not have the money for higher end personal computers.

Officevision

$7,000 workstation to send a message?" asked Anthony Mondello, IBM's vice-president of office systems development, in an interview last week. "My view is if someone is reaching a conclusion of completeness based on how much this is better than Profs, well, there's much more than that."

Critics suggested that Officevision could win more hearts if IBM were to address some nagging issues.

In short, IBM needs to better accommodate MS-DOS users in Officevision as well as offer support of other environments — most importantly Unix, analysts said. If it does not reach out to these users, then it will run the risk of watching what was to have been a market-leading office platform become little more than an upgrade for its existing host-based users, observers said.

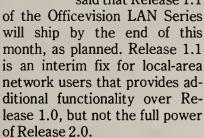In addition, IBM needs to deliver on its concept of the Officevision big picture — a user-friendly platform on which office functions and applications are integrated and work together. However, IBM cannot offer more evidence of this until the

IBM's Mondello
points to future

John Martini

appearance of Release 2.0, which has already suffered one delay.

This release, for which general availability is scheduled to begin in the fourth quarter, has both host-version support for OS/2, richer office tools and full application integration capabilities. Observers suggested that IBM push Release 2.0 to market as quickly as possible, or more users may shrug off Officevision as a collection of office tools that they already have.

Mondello last week reiterated his commitment to the new Release 2.0 delivery schedules, which are slated to begin with early releases at the end of this summer and continue into general availability through the first quarter of next year. Furthermore, he said that Release 1.1 of the Officevision LAN Series will ship by the end of this month, as planned. Release 1.1 is an interim fix for local-area network users that provides additional functionality over Release 1.0, but not the full power of Release 2.0.

As for the DOS and Unix issues, Mondello maintained his earlier position that a decision would be made by year's end.

Industry analysts emphasized that of all the Officevision issues, DOS is the most critical. According to Barbara Babcock, vice-president of office information systems at Gartner Group, Inc., IBM has positioned DOS as a lower functioning, character-based front end but could change that by supporting the upcoming release of Microsoft Corp.'s Windows 3.0. "It's far more important now to get broad support of Officevision and sacrifice OS/2 for another 12 months," she said.

Secondly, IBM must support other operating environments, specifically Unix, to avoid stamping Officevision as a proprietary solution. "If they had committed to a multivendor environment, it would have been a lot more attractive," said George Conniff, manager of information services at Bechtel Group, Inc. in San Francisco, which has no plans for Officevision. Instead, Bechtel will install a Digital Equipment Corp. Decnet network supporting Open Systems Interconnect specifications.

Finally, IBM cannot fail to meet the revised shipment schedules of Release 2.0. IBM was forced to delay all four Officevision Release 2.0 introductions earlier this year. However, it seemed to suffer little from this, primarily because Officevision has not been sitting on a huge pent-up demand, and as such, it did not leave scores of users in the lurch.

"They can get away with it for now, because no one else is doing anything that compelling," Babcock said.

Good office days

Two early users of IBM's Officevision gave it a thumbs-up last week.

The companies, both IBM host-based sites, are supporting hundreds of users under Officevision Release 1.0, which was installed earlier this year.

"We wanted to get something and integrate [office applications] into one set of menus that the users wouldn't be intimidated by," said Jerry Thompson, vice-president of information systems at Texas Credit Union League and Affiliates in Dallas. "The only thing we could come up with that would serve that need was IBM's product."

Thompson, who is running Officevision under the VM operating system, began hooking host-based applications to Officevision so that users on terminals and personal computers in Officevision can move from one set of functions to another from a single menu. "This has eliminated the need to sign off one and log on to another," Thompson said. "It's made life a lot easier to our non-DP-type community."

He has also integrated Graphical Data Display Manager, an IBM mainframe graphics package that can present statistical and other information in graphical format. In terms of PC presentation, it is a far cry from the full-blown iconic, graphical user interface that OS/2 will bring to future Officevision users, but Thompson said his users are satisfied with it.

United Gas Pipe Line Co. in Houston is another Officevision user that claimed to have a few hundred satisfied users. James McCoy, an IS manager at United, said his selection of Officevision was a case of good timing.

At the time of the Officevision rollout, the MVS shop was looking to move away from three Wang Laboratories, Inc. systems, which handled the office automation functions.

McCoy said Officevision represents a huge cost savings. Since the Wang systems were dedicated to office applications, he considered his previous total office functions cost to be approximately $1 million. In comparison, the Officevision purchase will cost about $60,000 to $70,000 per year. "That wasn't a hard decision for me to make," McCoy said.

ROSEMARY HAMILTON

Third parties bearing down on SAA

BY SALLY CUSACK
CW STAFF

One year later, several of the software companies that heralded IBM's introduction of Officevision seem to be concentrating their energies on delivering their own Systems Application Architecture (SAA) applications.

In February, when IBM announced shipment delays for the next release of Officevision, few — if any — eyebrows were raised at Dun and Bradstreet Software. Brian Cohen, vice-president of technology and research at the Natick, Mass.-based company, said D&B is

investigating the possibility of creating a more tightly coupled version of its Millennium SAA package, one that would fully implement the Officevision icon technology, but nothing definite is in the works.

Similar sentiments were echoed by Lotus Development Corp. in Cambridge, Mass. Mike Mitsock, a senior product marketing manager at Lotus, said that while the company is continually monitoring the situation with IBM, current users of Lotus' 1-2-3/G are not suffering at all, as the product coexists nicely with Officevision 1.0.

The delay is basically creating minor adjustments in product de-

velopment and marketing plans for the software vendors. According to Fred Braddock, vice-president of research and development at Sterling Software, Inc. in Canoga Park, Calif., the company revamped its original plans for Presentation/Answer, a software application program for moving data from IBM mainframes to desktop computers in an SAA environment.

The package, which runs under OS/2 Extended Edition Database Manager, was going to be released as a companion to Officevision. Now targeted for a mid-1990 launch, the software will debut as a stand-alone program.

AT&T unveils scaled-down, lower cost net manager

BY ELLIS BOOKER
CW STAFF

NEW YORK — AT&T pushed its integrated network management strategy forward last week, offering new features for its Accumaster products for monitoring and controlling AT&T long-distance services and private networks.

However, the best news for users, according to analysts, was the introduction of a scaled-down version of the Accumaster Integrator at half the price of the original graphical workstation-based umbrella management system that AT&T introduced in January.

The Integrator collects and correlates data from various AT&T and non-AT&T element management systems and is the brains behind AT&T's Unified Network Management Architecture (UNMA).

"The main problem with the Integrator has been its entry price; the minimum is $250,000, with a monthly fee of several thousand," said GiGi Wang, director of datacom research at

The Yankee Group.

At a beginning price of $180,000, the new Accumaster is limited to a maximum of two Sun Microsystems, Inc. Sparcstations and up to three element management systems. The original high-end system supports 10 workstations and up to 12 element management systems.

AT&T also said it has a promotional offer for the new version whereby users who buy before September get the system for as little as $110,00. While AT&T declined to state the size of its customer base for the Integrator, analysts said dozens of companies may be using the product today, with many more evaluating the system.

The high-end Integrator was also upgraded in what AT&T called a response to feedback from customers. Release 2, which will be available in the first quarter of next year for an additional $30,000, adds the ability not only to monitor alarm conditions on a network but also to restore service through automated scripts provided by AT&T or written by the customer.

TRENDS

Hospital Systems Market

A recent survey of 2,595 hospitals shows that when it comes to IS, the majority prefer to do it themselves

Methods of processing
Of the more than 60% of hospitals that elect to do their processing in-house, 68% are using IBM equipment
Percent of respondents
(Base: 2,595)

In-house 63%

Shared service 27%

Combination 9%

Facilities management — less than 1%

Time frame for replacement
Of the 670 hospitals that plan to make major changes, 44% will complete their modifications in less than nine months
Percent of respondents
(Base: 670)

1 to 9 months 44%

9 to 18 months 34%

18+ months 7%

Don't know 15%

Improvement
Patient-care systems — nursing systems that communicate with ancillary departments — are the first improvement hospitals hope to obtain from a new system
Percent of respondents
(Base: 670)

Patient-care system **23%**
Flexible reporting **19%**
Outdated system **14%**
Accounts receivable **13%**
Third-party logs **10%**
Response time **7%**
Integration **5%**
Accounts payable **5%**
Database **2%**
Cost accounting **2%**

Source: Hancock Information Group, Inc., Longwood, Fla.
CW Chart: Tom Monahan

N E X T   W E E K

Information management at fast-growing McCaw Cellular Communications means life in the fast lane for **Mark De-Camp** (left) and **Ken Arneson**. Manager's Journal takes a look at their efforts to rewrite core applications in order to remain consistent with McCaw Cellular's decentralized management philosophy.

Rich Frishman

Why not have one personal computer that you can use every day and then pack up to use on a road trip? Portable computer vendors would like to think that this is possible now, but users are not so sure. Expense, screen size and keyboard functionality are just some of the unresolved issues of portable computers. See Product Spotlight.

INSIDE LINES

No hot air
Word on the super side of the street has it that Minneapolis-based Cray Research will announce the long-rumored air-cooled version of its YMP supercomputer today. Industry sources said the new computer will cost about $2 million.

Everything's relative
Codd & Date, purveyors of the Relational Model and its famed 12 rules, is looking for a buyer for the consulting practice and Relational Institute. However, as with the firm's attempt at a Relational Model 2 last year, no one seems to be biting.

LAN plans, I
Rumors are getting stronger about disarray at Novell resulting from the proposed merger announced last month between Novell and Lotus. The image of local-area network makers working happily is fading. One industry leader who visited the company's Provo, Utah, headquarters said some high mucka-mucks appeared to be very uncertain about Novell's plans. The source suggested that managers may be hedging on answers or offering answers that may later prove wrong.

LAN plans, II
Meanwhile, farther west, 3Com is taking unspecified actions designed to raise its stock price (not the recent stock buy-back announcement). One manager said last week that the computer networking company is "sitting on tenterhooks" awaiting a hostile takeover bid. The source refused to reveal which companies appear to pose the greatest threat, saying, "I don't want to give anybody any ideas."

Don't color them Blue
Amdahl will announce its next generation of mainframes without waiting on IBM's next generation, the so-called Summit, according to company President Joe Zemke. Until its 5990 mainframe debut in 1988, Amdahl had trailed IBM's announcements to make sure the company didn't miss any of IBM's features. This may not mean that the new computer will appear before IBM's Summit, Zemke warned — only that its introduction will not depend on an IBM announcement.

Rushing to beat the clock
Windows 3.0 is not all Microsoft has up its sleeve. It will announce a Windows version of its so-far Apple Macintosh-only Powerpoint slide generator on May 18. We hear that Aldus is also moving Persuasion, a competitive product, to Windows.

Nothing to serve up
You can forget rumors of an impending release of Omega, Microsoft's Dbase alternative and Windows-based stand-alone database for SQL Server. It is supposed to be fully relational and object-oriented, with its own Basic-based data language. A source told us that the product has suffered design setbacks.

Hot links
The hot news at next week's ICA show will mostly concern software-defined networking — that increasingly strategic telecom service that allows users to enjoy private network-style management and configuration flexibility at dial-up prices. AT&T is rumored to be finally announcing a data version of its Software Defined Network. Also, U.S. Sprint will be demonstrating its new global Vnet connection — a real boon to users considering that, according to *The Financial Times,* British Telecom has been overcharging by as much as 74% for overseas connections.

National Semiconductor is discovering a new wrinkle in the term "corporate raider." The company's Santa Clara, Calif., headquarters is being overrun by cats. The little beasties also favor restricted areas that can only be entered with a special ID card, so animal handlers need to be escorted in. "It's not something you can just walk into," a company spokesman said. Unless you're a cat: "Then you can just wiggle in." If felines turn you off, call in your news tips to News Editor Pete Bartolik at 800-343-6474, communicate via fax at 508-875-8931 or address MCI Mail COMPUTER-WORLD.

THE SHORTEST DISTANCE BETWEEN TWO POINTS IS A STRAIGHT ANSWER.

Bureaucracy can kill a company.

It can also cripple its customers. Today, no one can afford to work with a maze of corporate buck-passers.

So at the new Wang, we're attacking bureaucracy head-on.

By some very hard but necessary decisions, we're revolutionizing our entire organization.

We have 21% fewer vice-presidents today than on July 1, 1989. 25% fewer directors. 36% fewer managers. 55% fewer supervisors.

What you find today is the muscle. Working muscle.

Over 20,000 people with the power and the willingness to act for you. People with answers for you.

Their work is already paying off for you.

For example, within 48 hours of placing an order, you'll now know *exactly* when your order will be delivered.

No ifs, ands or I-don't-knows.

Moreover, now no product will take more than eight weeks to arrive.

Most will take less than four. And many will be at your office within 24 to 72 hours.

Fast work, not fast talk. It's the shortest way we know to get to work.

LET'S GET TO WORK.   **WANG**

"If they can send a man to the moon, why can't they make my computers talk to each other?"

IBM Has Developed An Answer To The Looming Question Of Multivendor Networking.

As if getting people to work together weren't hard enough, you're faced with a somewhat more complex task.

Getting your computers to work together.

You see, computers, like people, need reliable connections to obtain, modify and distribute information.

And no other company connects more companies with more computers to more people than IBM.

Beyond physically connecting your computers, we help them to "interoperate" with each other.

This means that now, all your machines from different networks can speak the same language to each other. As a result, people can share all types of information: applications, files, resources, mail, anything. Whether it's across the hall, the country, or the globe.

Which is why we're committed to OSI solutions, to TCP/IP solutions and to SNA solutions: all to meet your open networking requirements for the '90s.

And IBM network management software will also help you better manage everything you've managed to network.

It's all part of IBM's commitment to helping all types of people using all types of computers work more productively together.

No matter how high their aspirations.

For more information, call your IBM Marketing Representative.

IBM